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# Geel 2000 Language Schools

## Science Department

### Primary (5)

### First term

### (2022 – 2023)



Name.....

Class.....

## Theme one: systems

### Concept 1.1 Plant needs

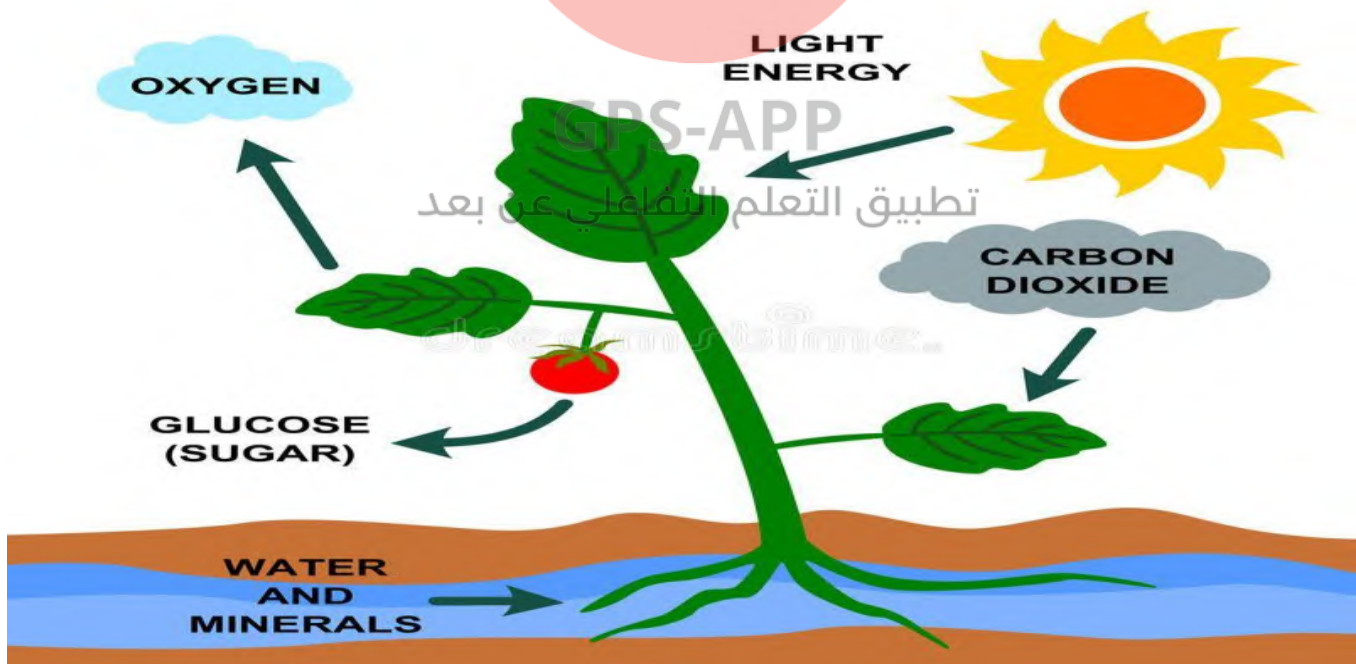
#### Lesson (1)

*A plant is a living organism, like a human being that goes through different stage of growth.*



#### Needs of the plants to survive:

- 1- water
- 2- air
- 3- sunlight
- 4- nutrients from soil
- 5- Carbon dioxide from air





## Parts of plant

### The root

- 1-Fixing the plant in the soil.
- 2-Absorbs water and mineral salts from the soil.

### The stem

- 1-Transports the water and mineral salts from the roots to all parts of the plant.
- 2-Support the plant.

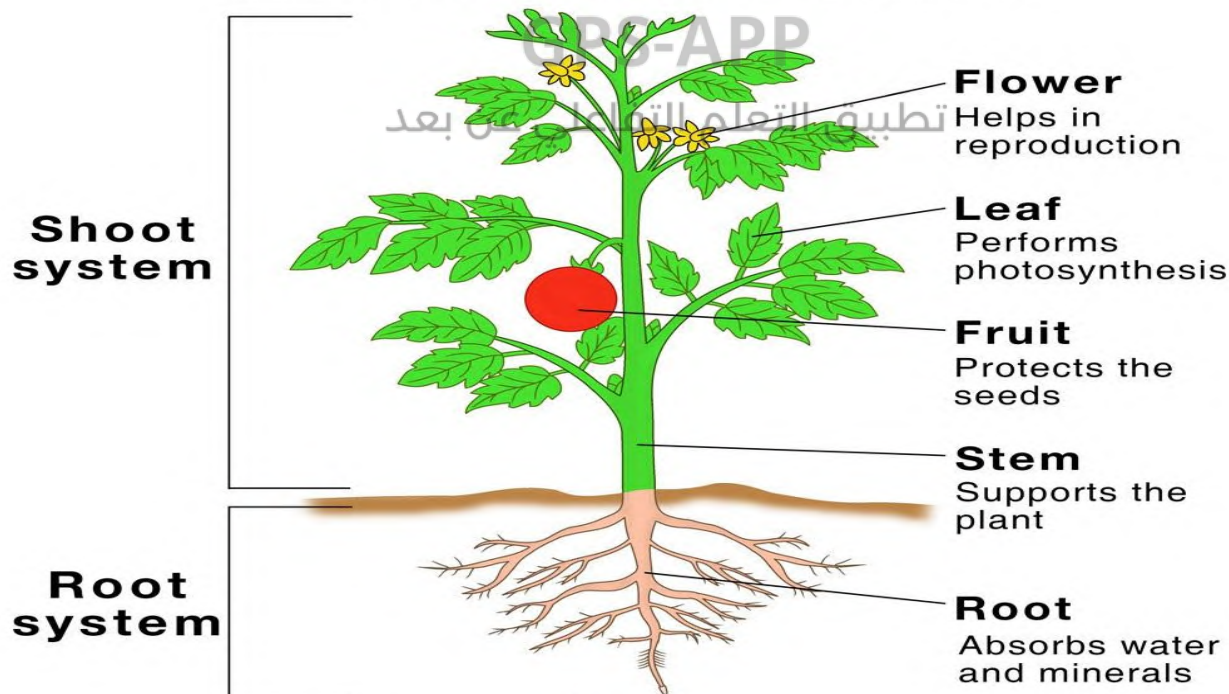
### The leaves

- Absorb sunlight and carbon dioxide gas.

### 4. The flower

- The reproductive organ of the plant to produce new plants.
- Store the food (starch- sugar – protein – fats).

## Parts of a Plant



## Plants needs



### Basic need

- Sunlight
- Water
- Carbon dioxide gas

### Not basic need

- Soil
- Sugar
- Oxygen gas

*Soil may not have been included as a basic plant need because:*

➤ *Some plants only grow in the water.*



➤ *Some plants grow on other plants instead of having roots in the soil.*

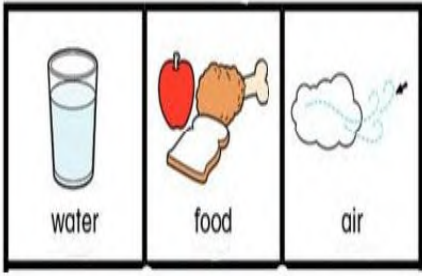
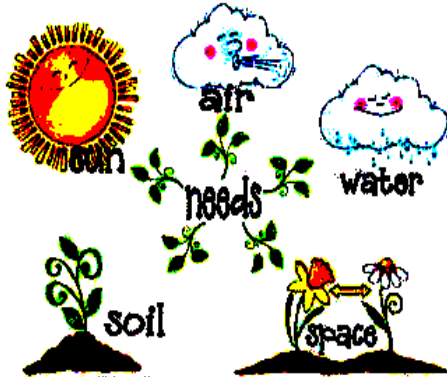




*Plants can grow on rocks.*



*There are differences between human needs and plant needs to survive:*

|                     | <i>Human Needs</i>   | <i>Plant needs</i>  |
|---------------------|--|---|
| <i>Similarities</i> | <ul style="list-style-type: none"> <li>• <i>The water</i></li> <li>• <i>The air</i></li> <li>• <i>The sunlight</i></li> </ul>  | <ul style="list-style-type: none"> <li>• <i>The water</i></li> <li>• <i>The air</i></li> <li>• <i>The sunlight</i></li> </ul>   |
| <i>Differences</i>  | <ul style="list-style-type: none"> <li>• <i>He gets food from plants and animals.</i></li> <li>• <i>He doesn't need carbon dioxide</i></li> </ul> <div data-bbox="375 1556 794 1829">  </div> | <ul style="list-style-type: none"> <li>• <i>It can make its own food by itself.</i></li> <li>• <i>It needs carbon dioxide to make food.</i></li> </ul> <div data-bbox="873 1440 1317 1814">  </div> |

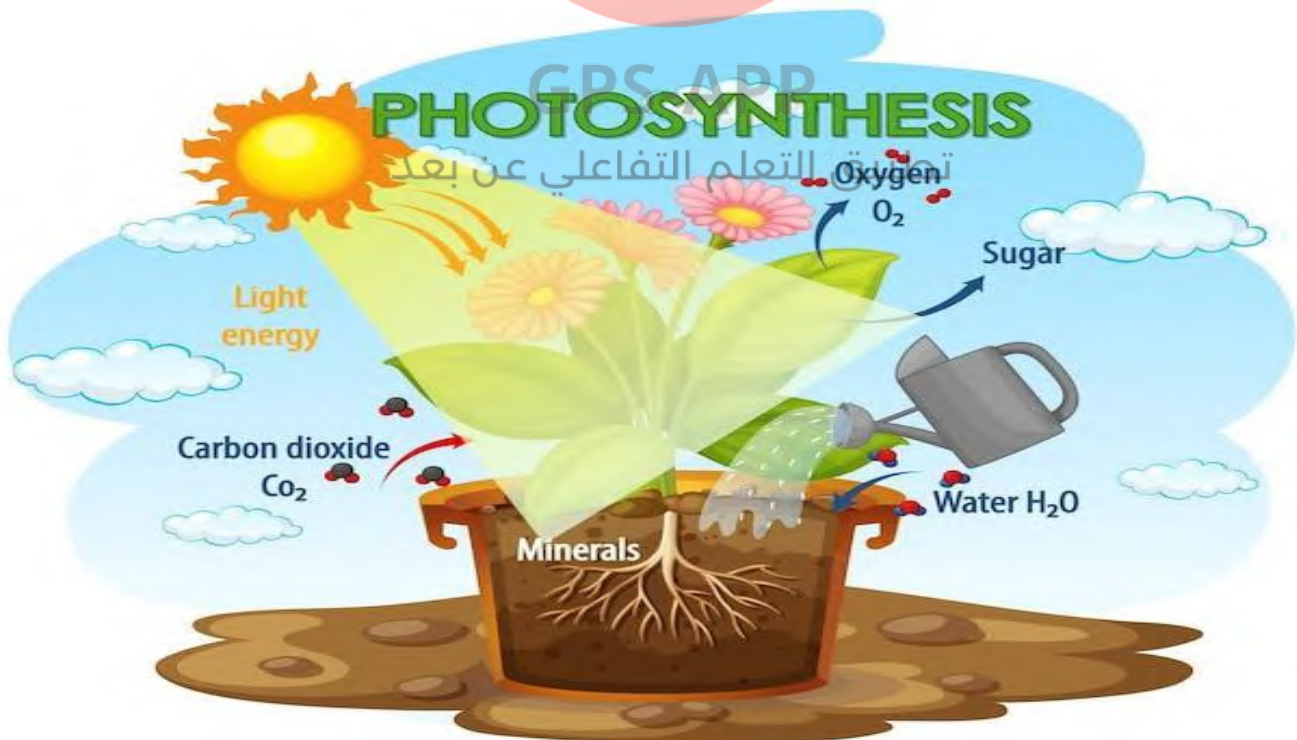
## Plant and food



- *Plant makes its own food*
- *Its food is a type of sugar that provides the plant with energy to grow.*
- *Plants make their food (sugar) in their leaves by "**photosynthesis**" process.*
- *The roots : absorb water and nutrients from the soil.*
- *the stem: transports nutrients and water from the roots to all parts of the plant.*

### Photosynthesis process:

It is the process in which plants use the energy in sunlight to make their own food.







**Q.1- Choose the correct answer:**

1- All the following are plant basic needs to make its own food, except

.....

- a. Water.                      b. air.                      c. sunlight.                      d. rocks.

2- The .....of plant get water and nutrients from the soil.

- a. Root.                      b. stems.                      c. leaves.                      d. flowers.

3-Human and other animals need to eat to get.....

- a. Oxygen gas.                      b. energy.  
c. carbon dioxide gas.                      d. soil.

4-Water and nutrients are carried from the roots to the leaves through the .....

- a. Stem                      b. soil                      c. fruits                      d. flowers

5- In photosynthesis process, plant produces..... to get energy.

- a. Oxygen gas.                      b. sugar.  
c. carbon dioxide.                      d. water.

**Q.2-Write the scientific term of each of the following:**

1. A gas taken from the air by leaves to help the plant to make its own food.

( .....)

2. A liquid substance that plants, animals and human need to survive.

(.....)

3. The process by which plant can make its own food.

(.....)

4. The gas which is released from plants during photosynthesis.

(.....)



### Q.3- Cross out the odd word:

1. Carbon dioxide gas – water – oxygen gas – sunlight. (.....)
2. Roots- stem- leaves – sunlight. (.....)

### Q.4- Choose from column (B) what suits it in column (a):

| (A)        | (B)  |
|------------|--|
| 1.Sunlight | a. is absorbed by the roots of the plant.                    |
| 2.Soil     | b. is necessary for plant's growth.                          |
| 3.Water    | c. is not a basic need for plant growth.                     |
| 4.Oxygen   | d. a gas which is produced during photosynthesis process.    |
|            | e. a gas which the plant uses during photosynthesis process. |

1-.....

2-.....

3-.....

4-.....





## Lesson (2)

### Do plants need soil?

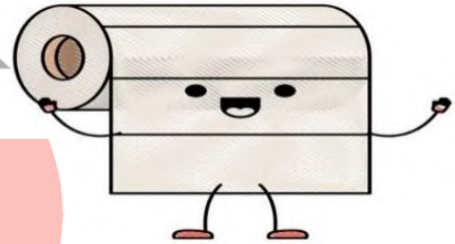
Experiment shows how plants grow in the light and in the dark.

#### ❖ Tools

1. Plastic cup contain potting soil.



2. Paper towels.



3. Plastic plate.

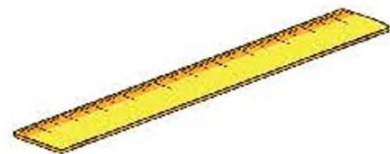


3. Water

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5. Metric ruler



## Steps:

*1- Germinate some seeds in a wet paper towel*



*2- Place three seeds in the top half of the paper towel and fold the bottom half of the towel up so that it covers the seeds then, place the paper towel inside the plastic plate.*



*3- Plant the other three seeds in the cup that contains potting soil then, water the seeds.*



*4- Place the plate and the cup in a place where they can get sunlight.*

*5- Check the growth of seeds over the next several days. Wet the paper towel and water the soil as needed.*



*6- Measure the growth of each seed using the metric ruler.*



*Note:*

**Hydroponic system:** should be full of water and minerals to help the plant grow.



## Observations:

- *The growth of the seeds placed in the paper towel is similar to that of the seeds planted in the soil*



After 7 days

- *The seeds grown without soil would not grow as quickly as the seeds in the soil.*

## ❖ Conclusions

- *The seeds can grow without soil if they water and sun.*
- *Plants can grow without soil for a while, but finally they need soil.*



After 14 days

**Germination:** means that the plant sprouts and begins to grow from a seed.

## Worksheet (2)

Q.1 Look at the opposite figure, then choose the correct answer:

**a. This process is called.....**

(Germination – photosynthesis – respiration)

**b. Seeds of plant will need ..... to  
complete its growth after many days.**

(Soil – water – insects)



Q.2 Look at the following figures then, complete the following sentences using the words below:

(Soil – figure A - figure B)



**Figure (A)**



**Figure (B)**

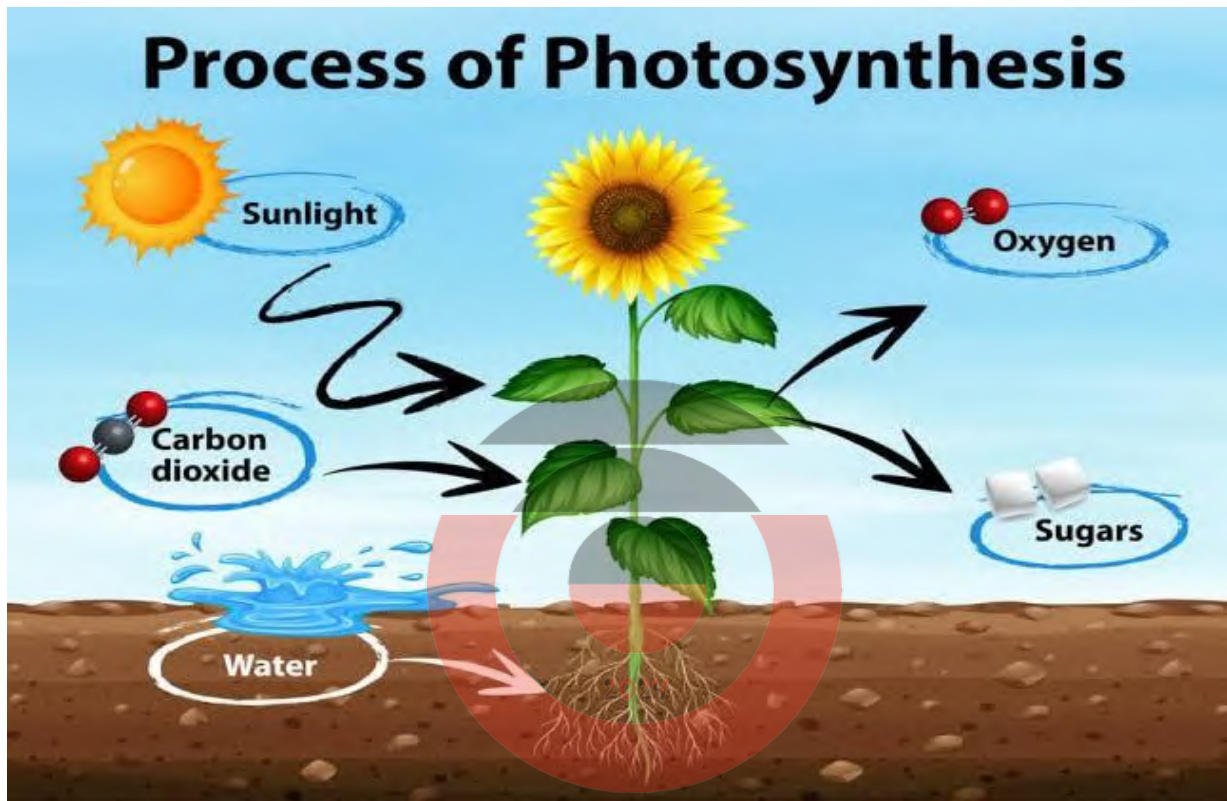
**1- The seeds in .....grow faster than those in .....**

**2- Seeds in figure (b) should be transferred into .....  
to complete its growth.**



## Lesson (3)

# Photosynthesis process

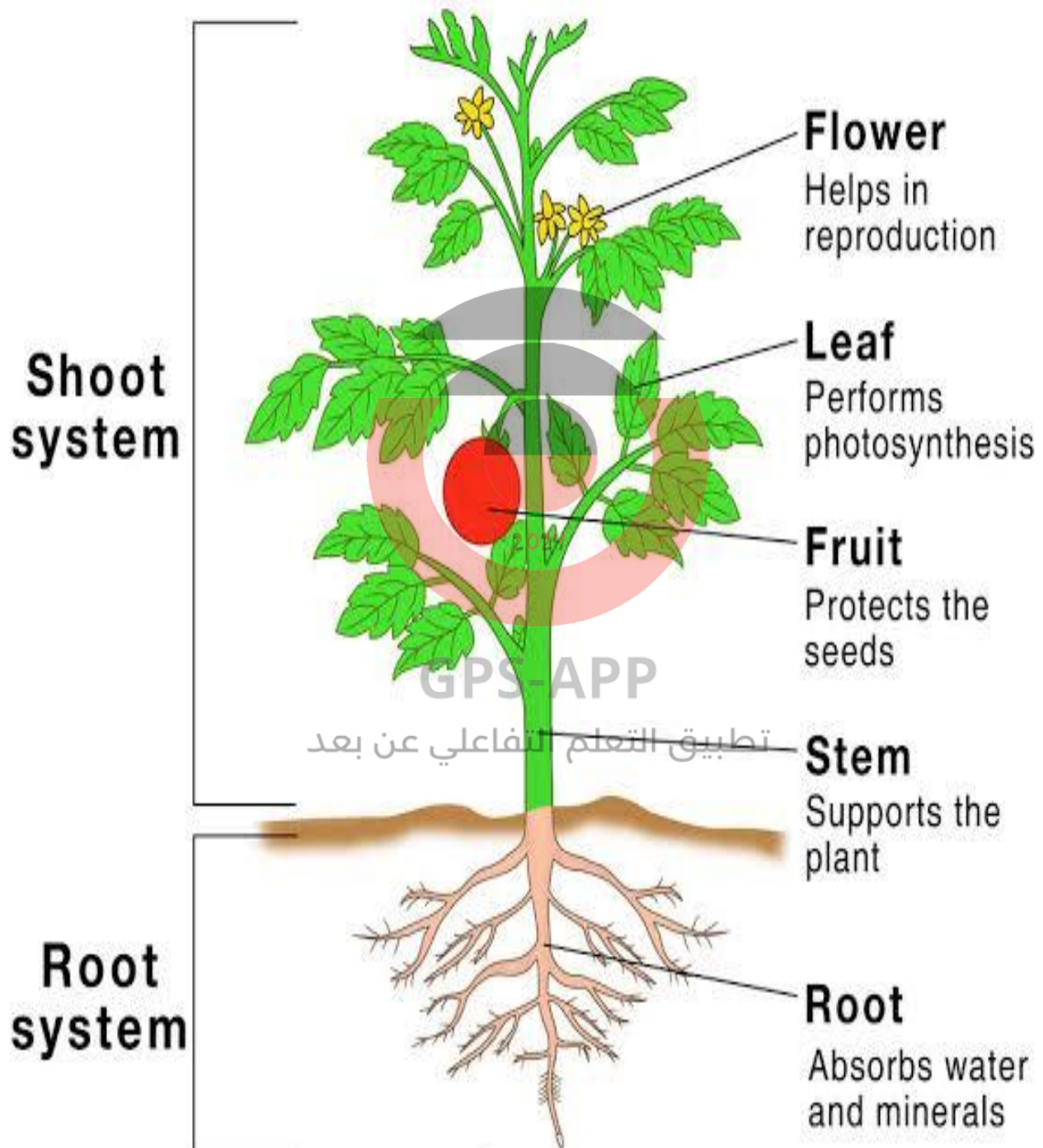


- Photosynthesis process: It is the process through which plants use the energy in sunlight to make their own food.
- The plant needs :
  1. Sunlight (sun )
  2. Carbon dioxide gas ( air )
  3. Water and salts (soil )
- The plant products :
  1. Oxygen
  2. Nutrients ( **sugar** , starch , fats , and protein )

*Light is a basic need for the plants like water and its food*



# Parts of a Plant



## *The structure of plants*

### *1. Leaves:*

- 1. They make food for the plant by photosynthesis process.*
- 2. They contain chlorophyll which gives them their green color.*
- 3. they collect sunlight and get energy from it.*

*The air enters the leaves through the stomata*

### Stomata:

*They are tiny openings that allow air to move into the leaves.*



### *2. Stem :*

- 1. They transport water and nutrients from the root to the stem and leaves through tubes called vessels or xylem.*
- 2. They supports leaves and flowers of the plant.*

### *3. Roots:*

- 1. They absorb water and nutrients from the soil and transport it to the other parts of the plant.*
- 2. They fix (anchor) the plant in the soil.*
- 3. Roots contain roots hairs : to get more water and nutrients and transport them from the soil to the root.*



## Root and root hairs



| <i><b>Xylem</b></i>  | <i><b>Phloem</b></i>   |
|--|--|
| <i><b>1. Transfer water and nutrient from roots to other plant's part.</b></i> | <i><b>1. Transport food from leaves to the other parts of the plant.</b></i> |



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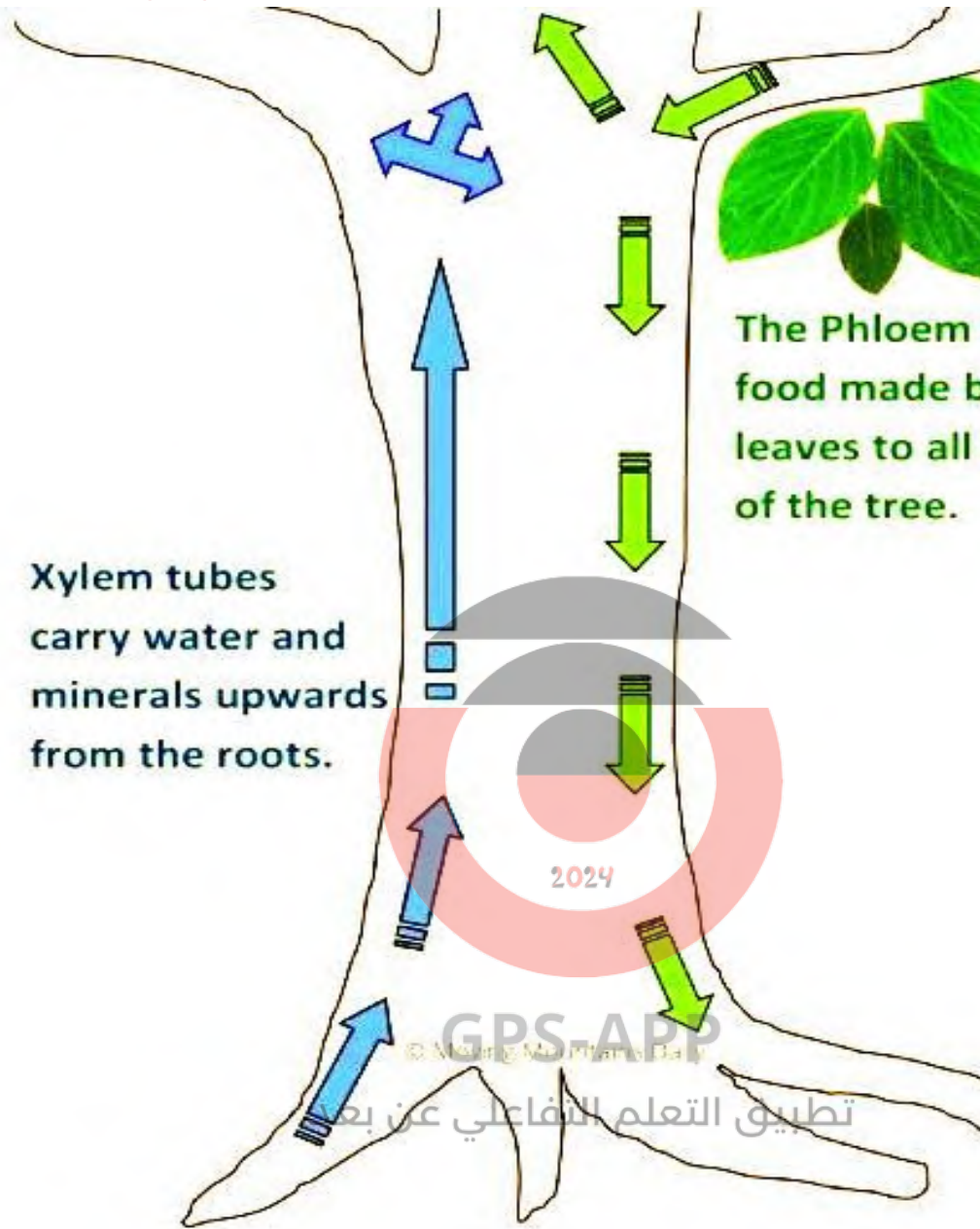
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## Worksheet (3)



### Q.1: Write the odd word

1. ( leaves , stem , eyes , root ) (.....)
2. ( air , sunlight , water , vegetables ) (.....)
3. ( stem , flower , oxygen , roots ) (.....)

### Q.2: Put true or false

1. Without sunlight the green plant will die quickly ( )
2. The plant that left in the dark has green leaves ( )
3. The plant needs water only to grow up ( )
4. Photosynthesis process is so important for plants ( )
5. Leaves and stem only are the structure of the plant ( )
6. The air enters the leaf from xylem ( )
7. Stomata is a tiny opening inside the leaf ( )
8. Plant's roots absorb water and nutrients from the soil and transport it to the other parts of the plant ( )

### Q.3: Write the science term

1. It is the process through which plants use the energy in sunlight to make their own food. (.....)
2. The plant needs that comes from the sun (.....)
3. Part of the plant that collect sunlight (.....)
4. The air enters the leaf from it (.....)
5. Small opening in leaves (.....)
6. Vessels in the stem of plants connect the stem with leaves (.....)



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**Q.4: Write the definition Of the following:**

1. *Photosynthesis process:*

.....  
 .....  
 .....

2. *Stomata*

.....

3. *Xylem*

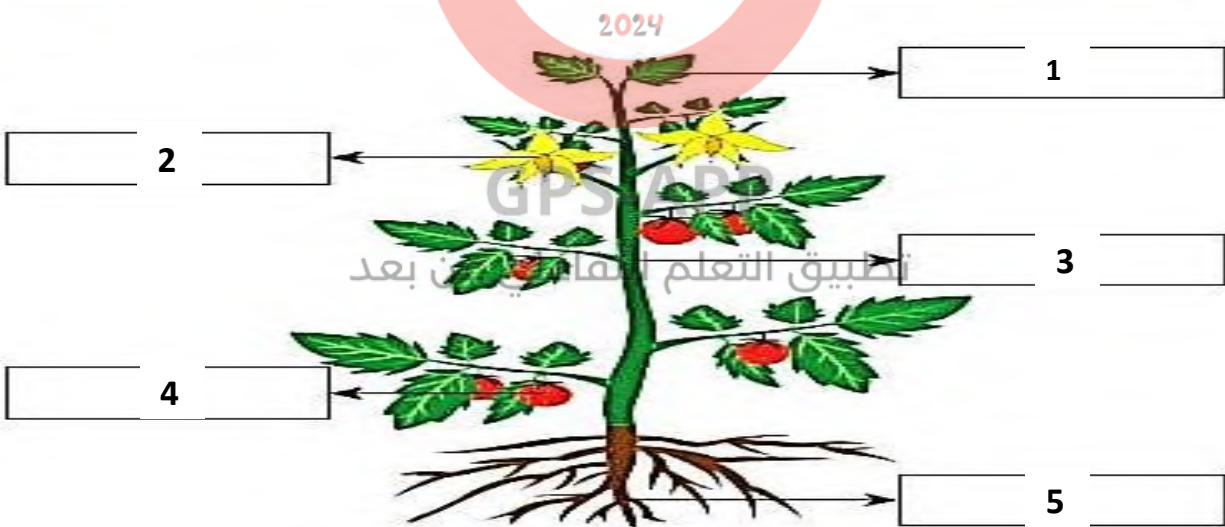
.....  
 .....

**Q.5: Complete the following:**

**Parts of a Plant**

Label the parts of the plant using the word bank.

|      |        |      |       |      |
|------|--------|------|-------|------|
| root | flower | leaf | fruit | stem |
|------|--------|------|-------|------|



1. (.....)

2. (.....)

3. (.....)

4. (.....)

5. (.....)



## Lesson (4)

### Parts of plants

*There are many forms of stems.*

1. *Wood stem such as tree trunks and shrubs.*



2. *Upright stems such as most of flower.*



3. *Climb stem such as vines (grapes).*



*Tuberous that stem extend underground such as potato plant.*



5. **Runners** that stem extend above and along the ground such as strawberry



**There are two kinds of leaves:**

- 1. Narrow leaves:** that look like needles, such as pine trees.



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## 2. Flat, wide leaves.



- Give a reason for it.

*The life on Earth without plants would be impossible?*

*Because during photosynthesis process plants produce oxygen gas that animals and people need to breathe.*



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**0.1 Complete :**

1. Human beings depend on plants and animals as a source of .....
2. Plants absorb....., and .....to make its food
3. Nutrients and water move up through the stem of the plant through the vessels called.....
4. Plants need.....energy to make food.
- 5..... is one of the important functions of the roots.
6. The stem of most flowers is.....
7. The stem of the plants that extend under the ground is called.....
8. Pine tree leaves are.....

**0.2 Put (true) or (false):**

1. Plant leaves contain openings. ( )
2. Tubers extend on the ground and help in the formation of new plants. ( )
3. The photosynthesis process occurs inside the leaves of plants ( )
4. The roots make the food for the plant. ( )
5. Without plants, life on earth is impossible. ( )
6. Xylem and phloem differ in plant functions. ( )
7. Sunlight is the necessary source of energy for plants to make their own food. ( )



## Lesson (5)

### Comparing plant and human systems

**The human circulatory system consists of:**

The heart and blood vessels (arteries and veins).

#### Circulatory system:

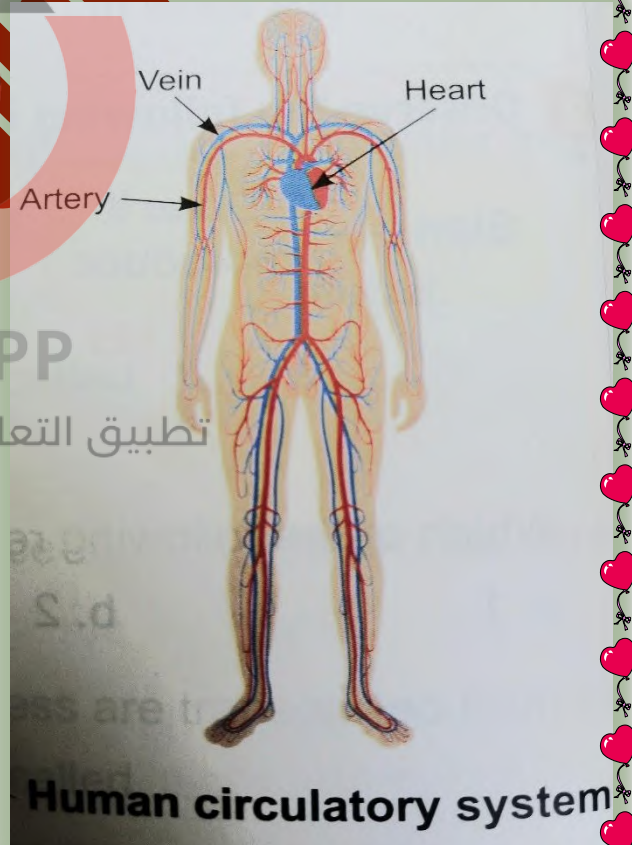
It is the system that transports blood and other fluids throughout the body.

# Arteries:

*Carry blood that is rich with oxygen and nutrients (glucose) from the heart to the body cells so that the body can grow.*

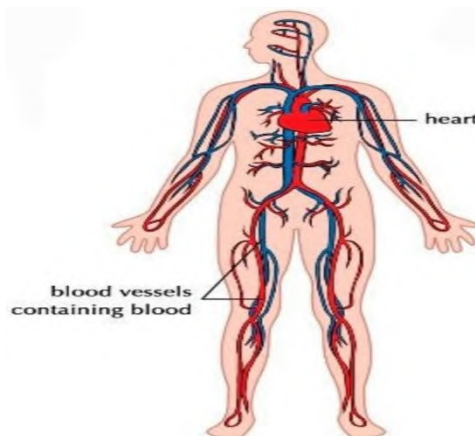
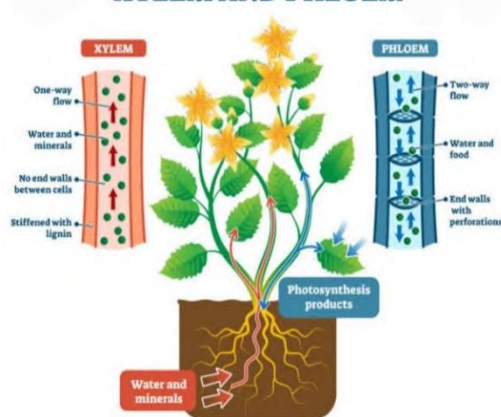
# Veins:

*Return the blood that carries carbon dioxide and is low in nutrients and oxygen back to the heart, then to the lungs where the blood carries oxygen again.*



|                     | <i>Plant transport system</i>  | <i>Human circulatory system</i>  |
|---------------------|--|--|
| <b>Similarities</b> | <ul style="list-style-type: none"> <li>• Both have system of vessels to transport water, nutrients and gases.</li> <li>• Both have one- way vessels.</li> </ul>  |  |
|                     | <ul style="list-style-type: none"> <li>• The transport system in plant is a system of tubes (xylem and phloem) that transport different materials around the plant parts.</li> <li>• <b>Xylem</b> tubes carry water and nutrients from the roots to the leaves.</li> <li>• <b>Phloem</b> tubes carry sugars from the leaves to all plant parts.</li> </ul> | <ul style="list-style-type: none"> <li>• The transport system in human is the circulatory system that moves blood around the human body.</li> <li>• <b>Arteries</b> carry blood rich with oxygen and nutrients (glucose) from the heart to all body parts.</li> <li>• <b>Veins</b> carry blood that contains carbon dioxide and is low in nutrients and oxygen from all body parts back to the heart.</li> </ul> |

#### XYLEM AND PHLOEM





# Plant food

- ❖ During photosynthesis process, **light energy** of the sun is transformed into **chemical energy** that is found in glucose.  
During photosynthesis process, the plant also produces oxygen and water which are released into the air.
- ❖ Flowers are the reproductive parts of many plants.

## Flowers and seeds

### Plant reproduction:

**It is the process of making new plants.**

### Function of the plant's flowers:

- Flowers produce seeds for the plant that help the plant to reproduce.
- When seeds receive air, water and the correct temperature, they can grow into a new plant.





## Worksheets (5)

### **Q1- Complete the following sentences:**

1. Plants make their energy in the form of.....sugar during photosynthesis process.
2. Air enters plants through stomata on their..... while it enters the human body through..... and.....
3. Human circulatory system consists of ..... and.....
4. Arteries carry blood rich in.....and oxygen from the heart to.....
5. The blood and other fluids are transported throughout the body by the.....system.
6. The plant makes sugar in its..... during photosynthesis process.
7. Transport system in the plant consists of two types of vessels which are.....and.....
8. Arteries carry oxygen and nutrients from the ..... to all body parts, while.....in plant's stem carry water from the..... to the leaves.
9. In plant's leaves,..... energy is converted into..... energy during photosynthesis process.
10. Flowers of the plant produce..... that help it to.....
11. There are two types of vessels in the human circulatory system which are..... And.....



**Q.2- Give reasons for:**

*1. Flowers are important parts for the plant.*

---

---

*2. Circulatory system has an important role for human to survive.*

---

---

*3. Xylem in plant is a one-way vessel.*

---

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## Lesson (6)

# Seed dispersal

***It is a process that seeds are transported from one place to another.***

### **Ways of seed dispersal in nature:**

1. Floating on water or rivers or lakes.
2. Traveling by wind.
3. Sticking to animal's fur or human clothes.
4. Being eaten by animals and comes out with their stool.

## Worksheets (6)

Look at the following seeds in the pictures below, then decide how you think the seeds in the pictures move from one place to another :



Coconut seed



Maple seeds



Tomato seeds



Burdock seeds



Apple seeds



Dandelion seeds

## Concept (1.2)

### Lesson (1)

#### **Ecosystem:**

*It is an area (or community) that includes living organisms and non- living things that interact with each other.*

*Living organisms as: plants, animals and humans*

*Non-living things as: air soil and water*

*Example of ecosystem: as ocean, a rainforest, desert or a sea*



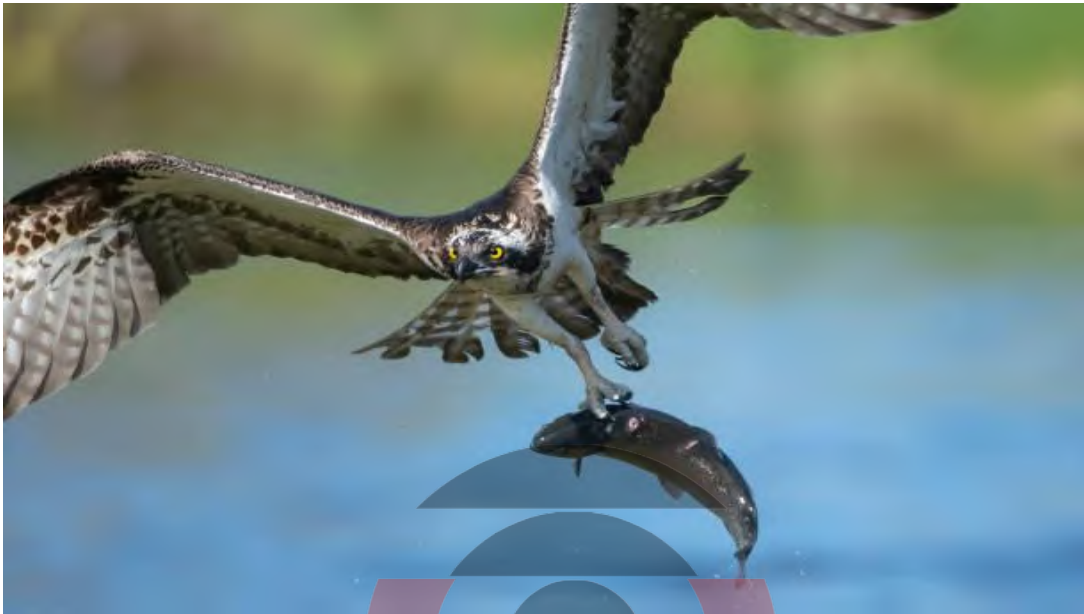
*The interaction that present in an ecosystem occurs between animals and plants only and not between all the components.*

#### ***How does energy flow through an ecosystem?***

*Energy flow through an ecosystem from plants to animals and between animals when they eat each other, then when living organisms die, their energy is returned to the soil.*



## *Hawks in ecosystem*



### *Important notes for Hawks*

- *Hawks get energy from food.*
- *Hawks eat different types of animals such as, snakes, mice, fish, birds, squirrels, rabbits and other small ground animals.*
- *Hawks do not eat plants, but they eat animals who eat plants, so they also depend on plants for energy.*
- *There are few predators that can attack hawks such as eagles or other hawks.*
- *When a hawk dies, it decomposes and its energy is returned to the soil.*



## Energy Flow in Ecosystems

A healthy ecosystem is a community that provides food, water and shelter to all living organisms that live in it.

**What are the type of food that living organism depends on:**

1-Caracal feed on rat (mice)



2-Rabbit feed on grass



3-Bird feed on earthworm or butterfly



There is a relationship between sunlight and energy that we get from the food.

Sun is the main source of energy in all ecosystem.

Animals need energy that comes from eating plants and other animals, as they cannot produce their own food.

## • Food is energy



★ Human gets energy during the day from

- The food we eat
- The oxygen we breathe

★ Sun is the primary source of energy for all organisms

| <b>Plants</b>  | <b>Animals</b>   |
|--|--|
| <p>During photosynthesis process, the <b>sunlight</b> converts <b>carbon dioxide</b> and <b>water</b> into <b>glucose</b> inside the plant leaves.</p> <p><b>Note:</b><br/> <b>Carbon dioxide</b> : is a gas present in air and necessary for the formation of plant food.</p> | <p>★ Animals including humans cannot make their own food</p> <p>★ They get energy from the environment in which they live.</p> <p>★ <b>Different animals can get their Food by:</b></p> <p>Eating plants only.<br/> Eating other animals that eat plants.<br/> Eating both plants and animals.</p> |



## Worksheet (1)

### Q.1 Write the scientific term of each of the following:

1. A community that contains living organisms and nonliving things.  
(.....)
2. The process that takes place inside plants through which we can get oxygen. (.....)
3. It is a form of energy that the plant need during Photosynthesis process. (.....)
2. It is the primary source of energy for all living organisms on the Earth.  
(.....)
5. A type of living organisms that can produce its own food by Absorbing sunlight. (.....)
6. The sugar that is formed inside plants during photosynthesis Process. (.....)
7. The gas that is present in air and necessary for the formation of plant food. (.....)
8. The gas that is produced from photosynthesis process.  
(.....)
9. Living organisms that both humans and animals need to Survive. (.....)

### Q.2 Give reasons for:

1. Human needs to eat some animals and plants

.....





## Lesson (2)

### **Food chains:**

- Living organisms eat food to get the energy to survive.
- Living organisms feed on one another, so energy passes between them.
- Living organisms are classified into three groups according to their way of feeding, which are:

**(1) Producers.**

**(2) Consumers.**

**(3) Decomposers.**

#### **1. Producers:**

**They are a group of living organisms that can make their own food .**

**★ Nearly all of the producers on the Earth are plants.**

| <b><u>Primary<br/>Consumers</u></b>   | <b><u>Secondary<br/>consumers</u></b>   | <b><u>Tertiary<br/>consumers</u></b>   |
|---|---|--|
| <p><i>They are animals that eat plants.</i></p> <p><i>Many insects are primary consumers.</i></p> | <p><i>They are animals that eat the primary consumers.</i></p> <p><i>Birds are secondary consumers, because they eat insects and other organisms that eat plants.</i></p> | <p><i>They are animals that eat the secondary consumers.</i></p> <p><i>Tertiary consumers are often large meat-eating animals like crocodiles.</i></p> |



Example: Plants use energy from the Sun to produce their own food by *photosynthesis process*.



## 2. Consumers

*They are organisms that eat other living organisms to get their energy, because they cannot make their own food.*

## 3. Decomposers

*They are organisms that carry out the process of decomposition by breaking down or decaying dead organisms.*

**Examples: fungi, bacteria, worms and millipedes**



Earthworm



Fungi

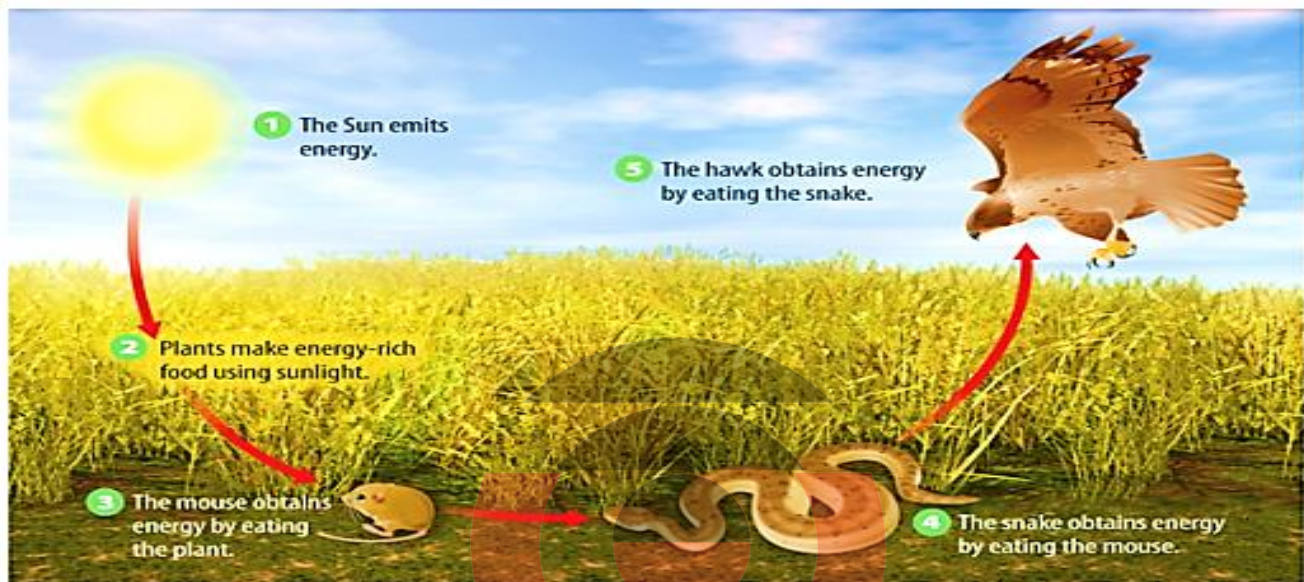


Bacteria

**★ Decomposition: it is the process through which decomposers can recycle nutrients into the soil.**

## • **Food chain**

*It is a model that shows one linear set of feeding relationships and energy flow between living organisms.*



*This figure shows the recycling nutrients back into the soil*

- **The first link in the food chain is plant (producer).**  
**Because it uses the energy from the Sun to produce its own food.**
- **The second link in the food chain is mouse (primary consumer).**  
**Because it eats plant,**
- **\*The snake is considered as a (secondary consumer).**  
**Because it eats mouse,**
- **Then the eagle is considered as a tertiary consumer.**  
**Because it eats snake.**
- **In the final the eagle dies, it decomposes by decomposers and its energy is returned to the soil which makes the food chain continuity.**





## • **Predator and prey**

*In the previous food chain, we can observe that*

*★The hawk and snake are "Predators", because they hunt other animals.*

*★The snake and the mouse are "Prey", because they are hunted by other animals for food.*

*So, both predators and prey pass food and energy through the food chain.*

### **Prey:**

*Is any animal that is hunted and eaten by another animal.*

### **"Predator"**

*Is any consumer that hunts and eats another animal .*



## Worksheet (2)

### **Q.1 / Complete the following sentences:**

1. Living organisms include..... , Consumers and decomposers.
2. Producers can make.....Sugar which is rich in energy through..... process.
3. Decomposers and ..... depend on producers to get their energy.
4. The most common producers are.....
5. The light energy of the Sun cannot flow directly to consumers and.....
6. In a food chain, the energy flows from..... Consumer to a secondary consumer
7. Decomposers are responsible for..... nutrients to the soil, that are needed for plants growth.

### **Q.2 What happens if..?**

1. All primary consumers disappear from a certain food chain.

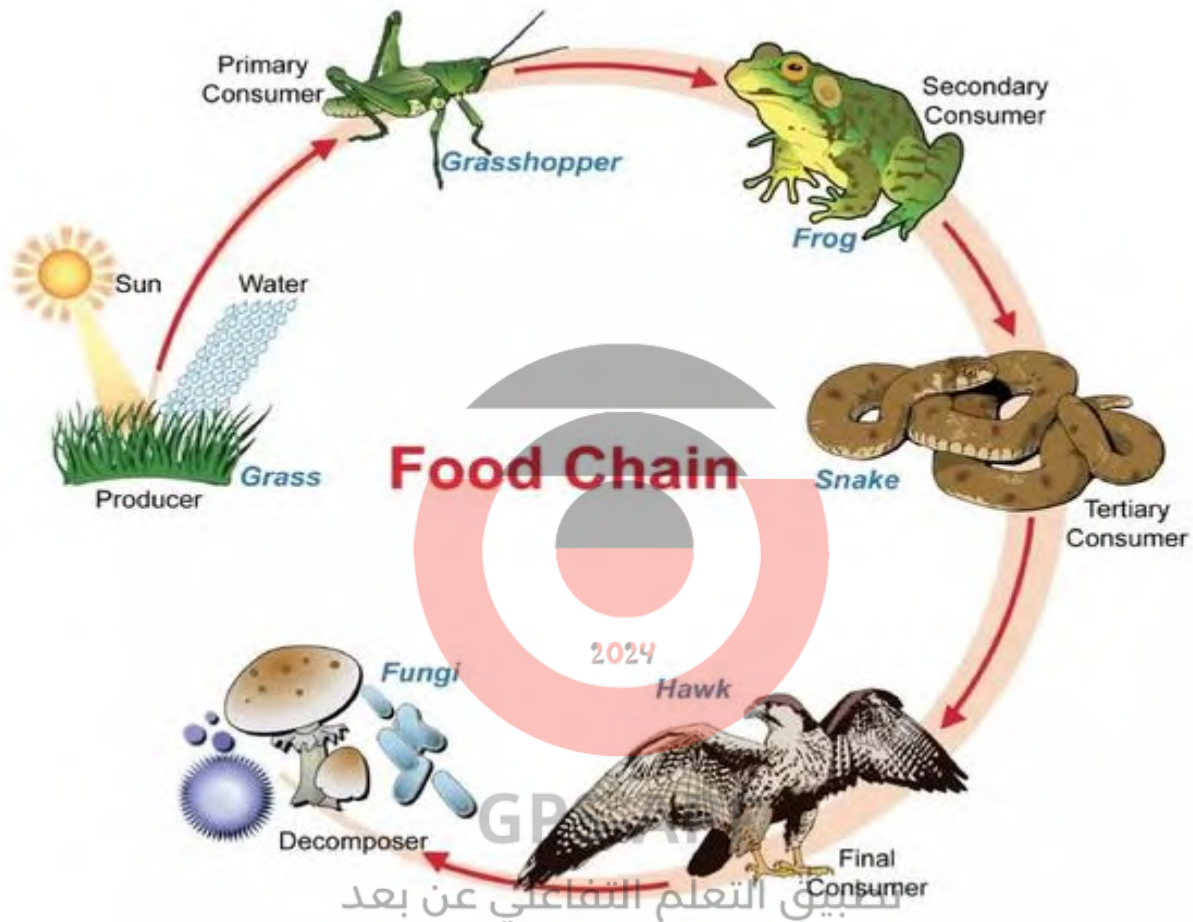
.....  
 .....

2. All types of decomposers are absent from an ecosystem.(.....

.....  
 .....

## Lesson (3)

### • FOOD CHAIN



### • FOOD WEB:

- It is a model that shows many different feeding relationships among living organisms
- The ways in which many food chains interact within an ecosystem form a food web.





## WORKSHEET (3)

### Q.1 Choose the correct answer

1. All the following are types of food for primary consumers, except  
a. grasses.                      b. seeds.                      c. fruits.                      d. eagles.
2. Both animals and humans bodies  
a. can absorb sunlight to make their own food.  
b. cannot absorb sunlight to make their own food.  
c. breathe carbon dioxide gas.  
d. don't need water to drink.
3. A hawk can eat..... when snakes are completely disappear from an ecosystem.  
a. grasses                      b. grasshoppers                      c. birds                      d. leaves
4. It is better for any predator to depend on.....to get its energy and survive.  
a. one species of consumers only  
b. many species of consumers  
c. one species of decomposers only  
d. many species of decomposers
5. All types of plants are similar in all the following characters, except they.....  
a. are able to make photosynthesis process.  
b. are eaten by primary consumers.  
c. can feed on producers.  
d. live in different types of ecosystems
6. Human is a ..... living organism.  
a. producer  
b. consumer  
c. decomposer  
d. predator
7. Secondary consumers can eat only.....  
a. decomposers.                      b. producers.  
c. Primary consumers.                      d. tertiary consumers.

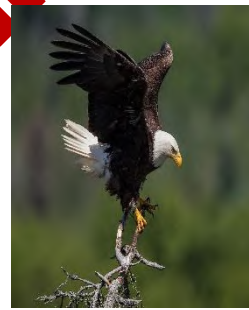
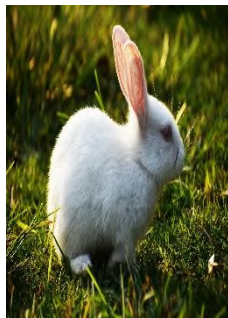
## Lesson (4)

### Food webs in neighborhood

Design a model of a food web by using the following cards that show different type of living organisms.

#### Tools

*Living organism's cards.*



#### Step (1)

*Classify the animals in the pictures above according to the type of food that each animal eats.*

#### Observation

*The mouse and rabbit eat the green plant.*

*The snake eats the mouse.*

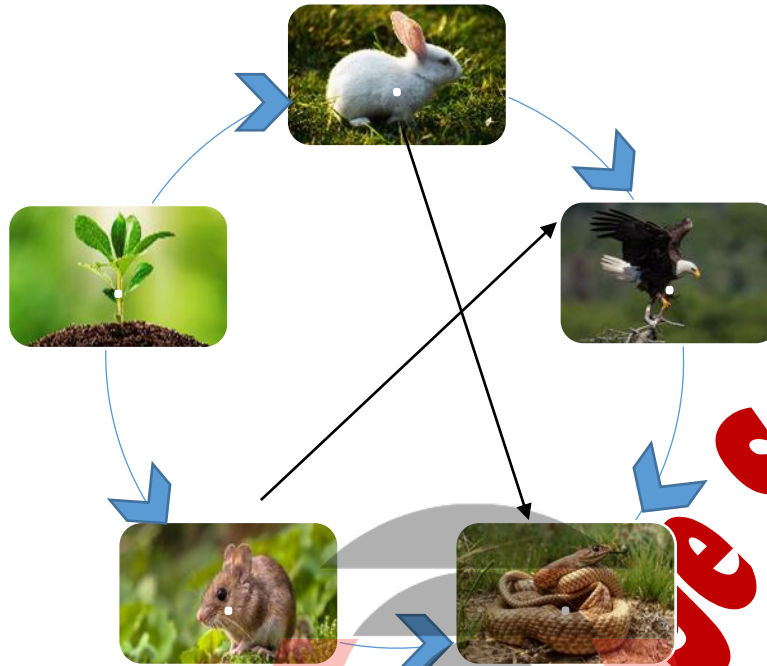
*The eagle eats the mouse, rabbit and snake.*

#### Step2

*Draw a food web using arrows to show the suitable food for each animal.*

#### Observation

*According to the previous steps, we can draw the food web:*



### Conclusion

- *Food web is a model that describes energy flow and feeding interactions between living organisms in an ecosystem.*
- *Food webs show that different organisms in an ecosystem are connected to allow energy to pass between them to survive, where:*
- *Producers are eaten by some consumers.*
- *Some consumers are eaten by other consumers.*
- *Some consumers may eat the same producer or prey.*





## Worksheet (4)

Q1. Complete the following sentences using the words below:

(Primary consumers - food web - food)

1. We cannot make a food web, if we don't know the types of..... that the.....animals eat.
2. The interconnected food chains are known as.....
3. An eagle can eat rabbits and mice, which are considered as.....

Q2. Study the opposite food web, then choose the correct answer:

1. This food web starts with

Which are producers.

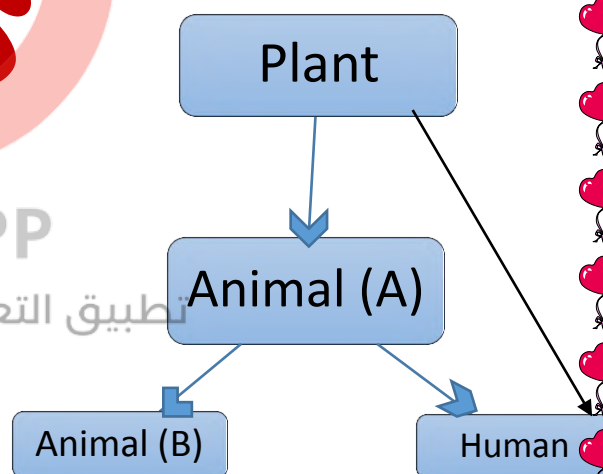
- a. human
- b. plant
- c. animal (A)
- d. animal (B)

2. Human can get energy from.....

- a. plant and animal (B).
- b. animal (A) only.
- c. plant only.
- d. plant and animal (A).

3. Energy cannot flow directly from the producer to.....

- a. human and animal (A).
- b. human and animal (B).
- c. animal (B) only.
- d. animal (A) only.



*a. animal* (A).

***b. animal (B).***

*c. plant.*

*d. human.*

*a. Plant*

### ***b. Human***

***c. Animal (A)***

***d. Animal (B)***

**Q3. Study the Following figure, then choose the correct answer below**



### *Plant*

# Grasshopper

# Frog

## Snake

*Which of the following, is necessary for survival of all living organisms?.....*

*a. Plant.*

***b. The Sun.***

*c. Grasshopper.*

*d. Snake.*

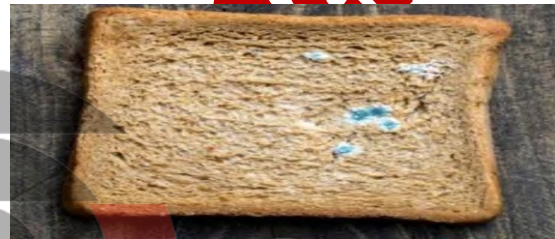
## Lesson (5)

### What are decomposers?

✚ *Decomposers are organisms which make one of the most important processes on the Earth which is called "decomposition process"*



*Mushroom fungus*



*Bread mold fungus*

✚ *Decomposition process happens to all dead organisms as follows:*

| <i>First</i>  | <i>Second</i>  |
|---|--|
| <i>When animals and plants die, there are animals called "scavengers" eat these dead organisms and break them down into smaller pieces.</i> | <i>Decomposers complete the process of decomposition by breaking down the smaller pieces of remains of dead plants and animals into nutrients that can be returned to the ecosystem so, Plants can use these nutrients to make their own food.</i> |





### Waste and dead organisms

#### 1. Waste:

- There are only one way that people use to reduce these waste materials and trash  
Known as "**Recycling**".

- In recycling process people use the waste materials and make new products instead of going into a landfill.



#### 2. Dead organisms

When organisms die, decomposers undergo decomposition process to release nutrients back into the environment so, they can be used again.

Example:

Remains of animals and plants are decomposed and become part of the soil, which is used by plants to make their own food.



#### Notes

- Decomposition process is considered as nature's recycling factory.
- Decomposition process takes place on land and also underwater



## Worksheet (5)

### Q1. Put (✓) or (x):

1. Food web shows interaction between many living organisms. ( )
2. Nutrients that present in living organisms bodies returned to the ecosystem after death. ( )
3. Both of bread mold fungus and house fly are decomposers. ( )
4. Scavengers decompose dead plants and animals into nutrients that can be returned to the ecosystem. ( )
5. Producers form their own food, while decomposers return nutrients back to the ecosystem. ( )
6. At the beginning of decomposition process, decomposers break dead organisms down into smaller pieces. ( )
7. Decomposers include mushroom fungus and slugs. ( )
8. Recycling of waste materials reduces pollution and the size of landfills. ( )
9. Both of bread mold and mushroom are two types of bacteria. ( )

### Q2. Write the scientific term of each of the following:

1. It is a process through which the nutrients found in dead organisms bodies return back to the ecosystem.  
(.....)
2. They are organisms that feed on dead organisms bodies and break them down into smaller pieces.  
(.....)
3. They are organisms that break down the remains of dead plants and animals into nutrients that return to the ecosystem.  
(.....)
4. It is a process through which humans can make new products from waste materials.  
(.....)



**Q3. Complete the following sentences:**

1. The interaction among many food chains is known as.....
2. Decomposition process done by two types of living organisms, which are..... organisms and..... organisms.
3. Nutrients that are resulted from decomposition process and returned back to the soil, can be consumed again by.....
4. Snails, earthworms and slugs are considered as ....., while vultures, crabs and cockroaches are considered as.....
5. Decomposition process takes place on land as well as under.....
6. Bread mold and mushroom are two types of.....
7. It is better to .....waste materials than throwing them in an ecosystem.

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## Lesson (6)

**Ecologist:** They are the scientists who work on restoration projects to Have a stable environment for plants to survive.

**Prairie:** it is suitable ecosystem for plant community ecologists to do their researches.

**Restoration ecology:** means rebuilding habitats that are damaged.

★It helps animals to increase their number.

★restoration ecology positively affects human health.

★Human and engineers must share scientists in restoration ecology.

★Restoration projects must include restoring of shelters, food and water resources.

### **Seed Dispersal**

♥ The transport and (disperse) of plant's seeds to grow in environments.

★Ways help plants to disperse their seeds:

**Water - air - animal and human bodies - wind**

★Types of seeds:

♥ **1-Sticky seeds** : that stick to human clothes or an animal's body.

So human or animal can carry these seeds to another place where seeds fall down.

♥ **2- Small light seeds** : that are dispersed by wind, these seeds fly away to new habitats to grow in other places.

Worksheet (6)



**Q1 Choose the correct answer:**

**1. Restoration ecology means.....**

- a. damaging the rebuilt habitats.**
- b. rebuilding habitats that are damaged.**
- c. throwing plastic products in seas.**
- d. throwing plastic products in deserts.**

**2. Restoration ecology helps animals to.....**

- a. move away to another ecosystem.**
- b. adapte to damaged ecosystem.**
- c. decrease their number.**
- d. increase their number.**

**3. All the following ways help plants to disperse their seeds, except.....**

- a. water.**
- b. air.**
- C. animal bodies.**
- d. sunlight.**

**4. Plants with sticky seeds need... .. to stick to disperse and grow in a new habitat.**

- a. air**
- b. water**
- c. light energy from the Sun**
- d. body of a living organism.**

**5. Wind play an important role in dispersing seeds.....**

- a. small light**
- b. big heavy**
- c. sticky**
- d. floating**



**Q2 Put (✓) or (X):**

1. People and engineers must share scientists in restoration ecology. ( )
2. Restoration ecology negatively affects human health ( )
3. Restoration projects must include restoring of shelters, food and water resources. ( )
4. All plants need the same way to disperse their seeds. ( )
5. Both of small light seeds and big heavy seeds can disperse by wind.( )

**Q3 Write the scientific term of each of the following**

1. They are scientists who work on restoration projects to have a stable environment for plants to survive. (.....)
2. Organisms that use human clothes or animal bodies or even wind to disperse their seeds to new habitats. (.....)
3. The suitable ecosystem for plant-community ecologists to do their researches. (.....)





## Concept 1.3 Change in food webs:

### Lesson (1)

#### **The ecosystem affected by:**

- 1- Pollution.
- 2- Climate changes.
- 3- Human activities.

**Pollution:** it is the harms happen to air, water and soil due to human activities.

#### **The effects of environmental changes on the food web?**

- 1- The disappearance of producer: make consumers migrate to search For food.
- 2- The presence of a large number of one type of organism: make their Food disappear.

#### **Protection of the ecosystem:**

**Protection the environment in Palau Island:**

**Control the human activities on land by:**

- 1- Avoid water pollution (when throwing waste materials in ocean.
- 2- Prevent overfishing (catching many fish from rivers, seas and ocean.

**Note:** if an ecosystem changes the food webs will change.

**-If there is a gentle rain in the desert → the desert ecosystem may be improved (Give reason)**

**Because rainwater will feed the plants.**

**-If There is a heavy rain in the desert → the desert ecosystem may be harmed. (Give reason)**

**Because the water of heavy rain will cause flooding.**

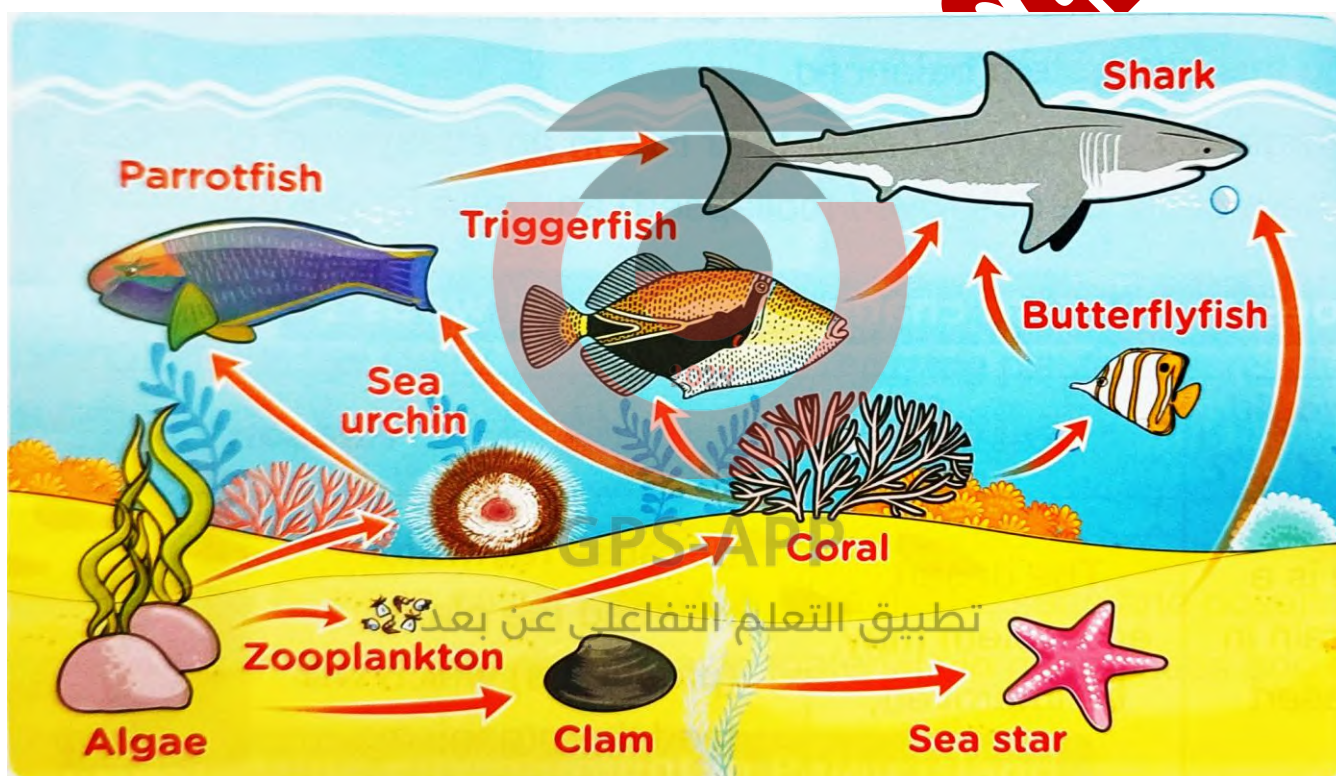
-If there is a drought and all the grass dies → the food web in the ecosystem may be **destroyed. (G.R)**

**Because the plants will die and also the organisms will die.**

- If there are many top predators in the food web → the other organisms in the food web like lions, tigers and sharks may be **harmed. (Give reason)**

**because the top predators will eat all the organisms.**

### ★ Marine food web:



- Algae → ☐ clam → ☐ sea star → ☐ shark
- Algae → ☐ zooplankton → ☐ coral → ☐ butterfly fish → ☐ shark
- Algae → ☐ zooplankton → ☐ coral → ☐ tiger fish → ☐ shark
- Algae → ☐ zooplankton → ☐ coral → ☐ parrot fish → ☐ shark
- Algae → ☐ sea urchin → ☐ parrot fish → ☐ shark



## Worksheet (1)

➤ **Choose the correct answer:**

- 1- On extreme hot climate, the water of a lake ....
  - A) Increases due to evaporation.
  - B) Decreases due to evaporation.
  - C) Changes into ice.
  - D) Has a lower temperature.
- 2- All the following are human activities that affect a marine ecosystem, except.....
  - A) Flooding.
  - B) Throwing human wastes.
  - C) Overfishing.
  - D) Throwing plastic garbage.
- 3- All the following are top predators, except .....
  - A) Hawks.
  - B) Tigers.
  - C) Butterfly fish.
  - D) Lions.
- 4- The marine food web usually started with.....
  - A) Calm
  - B) Algae.
  - C) Zooplankton.
  - D) Parrotfish.
- 5- If calm are completely removed from a marine ecosystem, the survival of ..... May be affected.
  - A) Tiger fish
  - B) Sharks
  - C) Sea urchin
  - D) Sea stars





➤ Put (✓) or (x) :

- Overfishing is one of the climate changes that affects the marine ecosystem. ( )
- It is better to recycle the waste materials than throwing them in rivers and seas. ( )
- What is happening on land doesn't affect what is happening in marine ecosystem. ( )

➤ What happens if...?

- 1- Throwing big amounts of plastic garbage and waste materials in water.

.....  
.....  
.....

- 2- A small lake is exposed to extreme hot climate for several months.

.....  
.....  
.....

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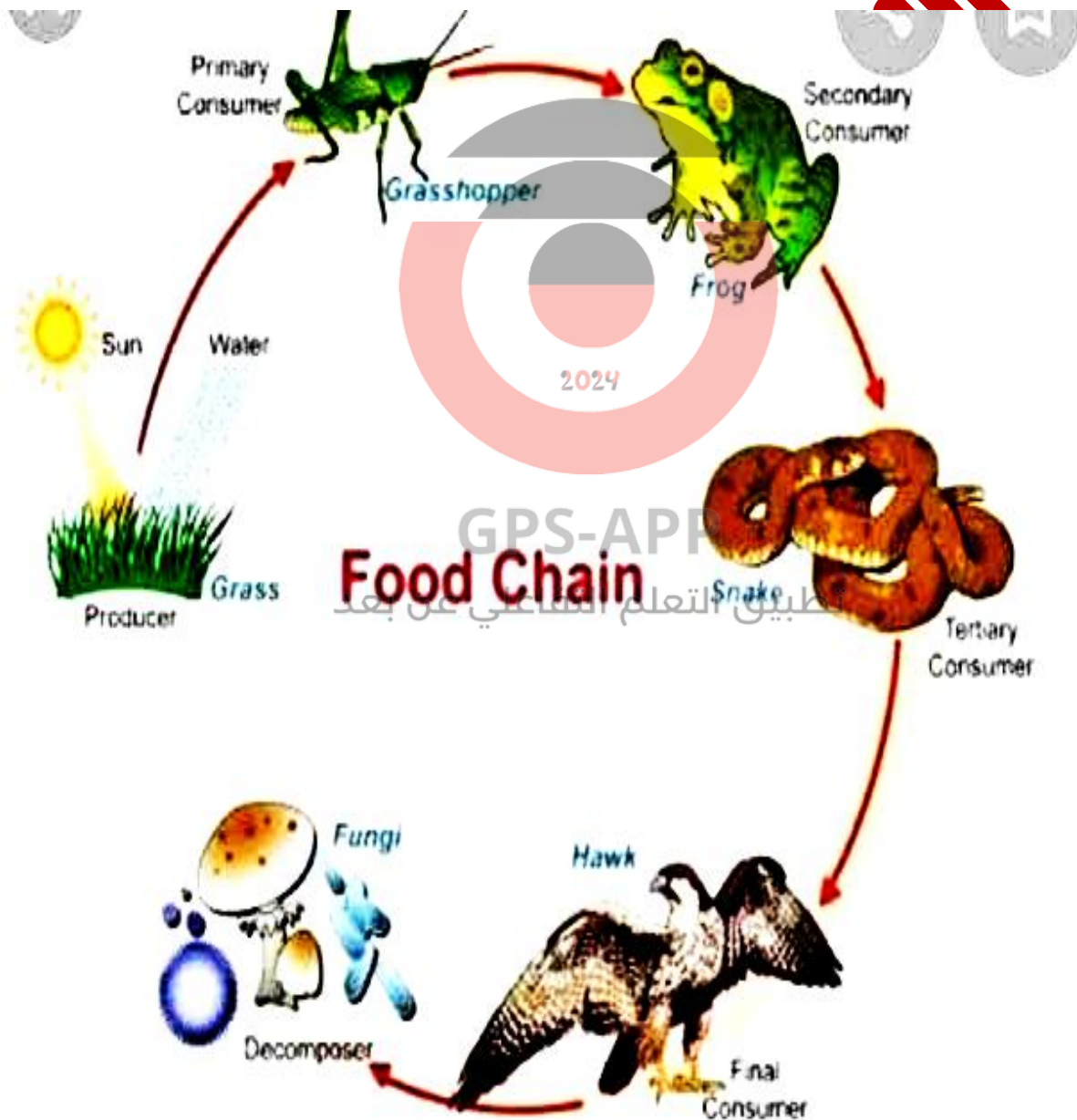
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## Lesson (2)

# Energy flow

- **Energy can't be created or destroyed but it transfers.**
- **The first source of energy is the sun, then energy transfers to plants (producer), then transfers to (consumers) that when they die the (decomposers) convert them into simple substances and return the energy back to the soil.**

### ▪ **Desert food web:**





- The sun transfers energy to producers until it reaches the decomposers, as follows:



✓ **The sun** is the main source of energy.



✓ **Producer:** green plants

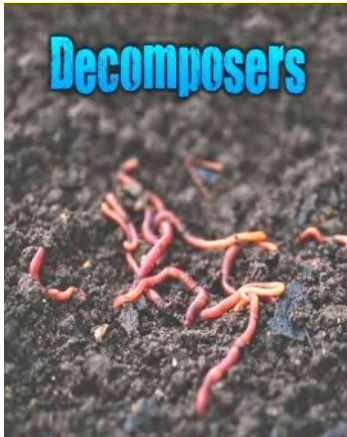


✓ **Primary consumer:**  
energy transferred to the primary consumer when it feeds on plants.





- ✓ **Secondary consumer:**  
energy transferred to the secondary consumer when it feeds on primary consumer.



- ✓ **Decomposer :** gets energy from decomposing the bodies of dead organism.

- The energy in the overall system remains as the same ,where :
  - ❖ 10 % only of this energy transfers between living organisms when an organism feeds on the other.
  - ❖ 90 % of this energy is left to decomposers which return this energy back to the soil.



## Worksheet (2)

### ➤ Write the scientific term of each of the following :

1. They are consumers which feed on secondary consumers. (                      )
2. They are living organisms that include bacteria and fungi, which return energy back to the soil. (                      )

### ➤ Complete the following sentences:

- 1-Predators of living organisms may be ..... for other living organisms.
- 2-A predator gets ..... From the prey which feeds on.

### ➤ Put (✓) or (x) and correct the wrong answer:

- 1)90 % of the in a food web transfers between living organisms when an organism feeds on the other. (                      )
- 2)The soil fertility depends on decomposers. (                      )
- 3)The sun produces energy that decomposers use to make their food. (                      )

### ➤ Choose the correct answer:

- 1)Decomposers play an important role in returning the energy back to all the following, except .....
  - A) the air
  - B) The soil
  - C) The water
  - D) The decomposers
- 2)In a food chain, the energy transfer .....
  - A) From a predator to a prey.
  - B) From a prey to a predator.
  - C) From a predator to a producer.
  - D)From a consumer to a predator.
- 3) It is better for a predator in a food web, to have .....
  - A)Only one type of decomposers.
  - B)More than one type of decomposers.
  - C)Only one type of prey.
  - D)More than one type of prey



## Lesson (3)

### Pollution

- Pollution effect on food webs (G.R) because if an animal exposed to pollution and dies, it affects all other levels of the food web.
- **Forest fire produces smoke and ash that are spread all over the forest and cover the grasses, causes difficulty breathing of animals.**
- **Pollutants produced from forest fire harm: (air, grasses, animals, respiratory system).**
- **Leakage of oil into seawater negatively affects the marine organisms.**

### Population changes

- ❖ **Population:** it is the number of organisms of one type of species living in an area.
- ❖ **Factors affect the population:**
  - ✓ increasing or decreasing the amount of water.
  - ✓ increasing or decreasing the temperature.
  - ✓ Climate change.
- ❖ We know that all species depend on other species for survival, so an increase or decrease in one species affect the population causing **population change**.





❖ Example:

Microorganisms (producer) → small fish → seabirds



★ Seabirds feed on small fish, the small fish feed on microorganisms that float on the surface of the sea.

★ Seabirds build their nests on the top of mountain cliffs.

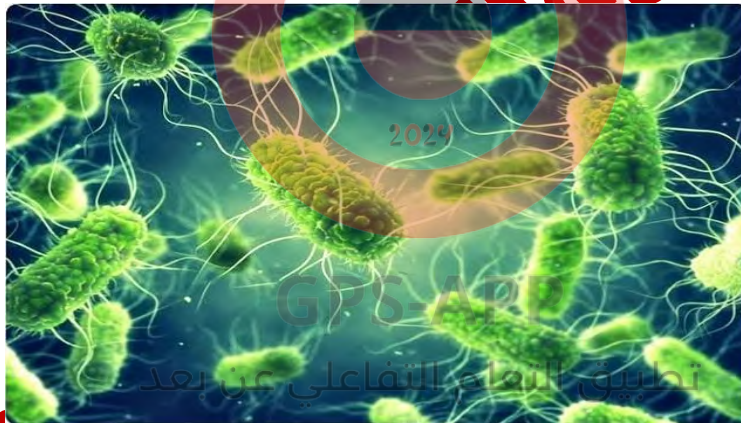
Note:

✓ **Microorganisms:**

★ They are too small organisms that can't be seen by eyes.

★ They are producers in the marine food web.

★ They make their own food and live in cold water habitats.



➤ If water temperature increase, microorganisms will move search for colder water then small fish search for microorganisms that lead to death of sea birds.

**Give reasons for:**

1-If the temperature of water increase the sea birds will die.  
.....

2-Food webs can be destroyed due to pollution.  
.....

**Write the scientific term of each of the following:**

1-They are organisms that are too small for people to see with only their eyes . ( )

2-It is the number of organisms of one type of species live in an area.  
( )

3-It is the harms that happen to air, water or soil by substances that can harm living organisms. ( )

**Study the following two diagrams, then put (✓) or (x) :**

Diagram (A)



Diagram (B)

- Both diagrams (A) and (B) show two food webs. ( )
- In diagram (B), both of seabirds and sharks are secondary consumers. ( )
- In diagram (A), if small fish are removed, the seabirds are negatively affected. ( )
- There is a food relationship between seabirds and sharks, where each of them can eat the other. ( )
- In diagram (B) if sharks are removed, the seabirds population may be decreased. ( )



## Lesson (4)

### Habitat loss

- Healthy habitats are important to all organisms in food web (G.R): because they provide organisms with resources that they need to survive.
- When these habitats are destroyed, different organisms may not be able to survive.

❖ Example of habitat loss in a coral reef system :

#### **Coral reef:**

- ✓ Some of the most diverse and valuable ecosystem on earth.
- ✓ they provide food and shelter for large numbers of fish and other marine organisms .
- ✓ They are important for tourism.





➤ Coral bleaching : ( G.R )

When water is very warm, coral reef will get rid of the algae living in their tissues it make coral reefs turn completely into white.



➤ The result of coral bleaching:

- ✓ Fish and other marine that depend on coral reef for food and shelter may die.
- ✓ People that depend on coral reefs and for food will be negatively affected.

Notes:

- Human activities can affect the ecosystem by :
- Building up more buildings.
- Throwing waste materials in water.
- Overfishing in seas and oceans.



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## Plastic pollution:



- Plastic in sea affect marine life, where whales, sea turtles, sea birds and fish can't often differentiate between real food and plastic.
- Sea turtles can't differentiate between a jelly fish and plastic so it eat a lot of plastic and get harmed.
- Coral reefs harmed by feeding on plastic due to the effect of UV rays which break down the plastic into micro plastic which look like the food of coral reefs.



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## Worksheet (4)

### Choose the correct answer:

1- Healthy marine environment is important for survival of .....

- A) Humans
- B) Lions
- C) Fish
- D) Deers

2- When water temperature increases, algae leave tissues of ..... so they become bleached.

- A) Seabirds
- B) Coral reefs
- C) Calm
- D) Sharks

3- Both of sea turtles and ..... Are present in the same marine food chain.

- A) Deers
- B) Jelly fish
- C) Eagles
- D) Tigers

4- When coral reefs.....the seawater, they may ingest micro plastics.

- A) Evaporate
- B) Filter
- C) Cool
- D) Warm

### Write the scientific term of each of the following:

1) It is a condition in which coral reefs turn completely into white.

( )

2) Small pieces of plastic in the size of rice grains and they cause harms to marine organisms.

( )





3) It is a process that people can do for plastic waste materials Instead of throwing them in the seas and oceans. ( )

- Complete the following sentences using the these words:

(Toxic – overfishing – shelter – extinction – predator)

1- Healthy natural resources include clean air, healthy food, water and suitable.....

2- The human activity that directly decreases the marine population is .....

3- Habitat loss is not only decrease marine population but also it is one of the main causes of .....

4- When a sea turtle Eats a jelly fish, this means that the sea turtle is a .....

- Give reasons for :

1- Coral bleaching happens when the water temperature rises.

.....  
.....

2- Both of rising water temperature and ingesting micro plastic are harmful for coral reefs.

.....  
.....



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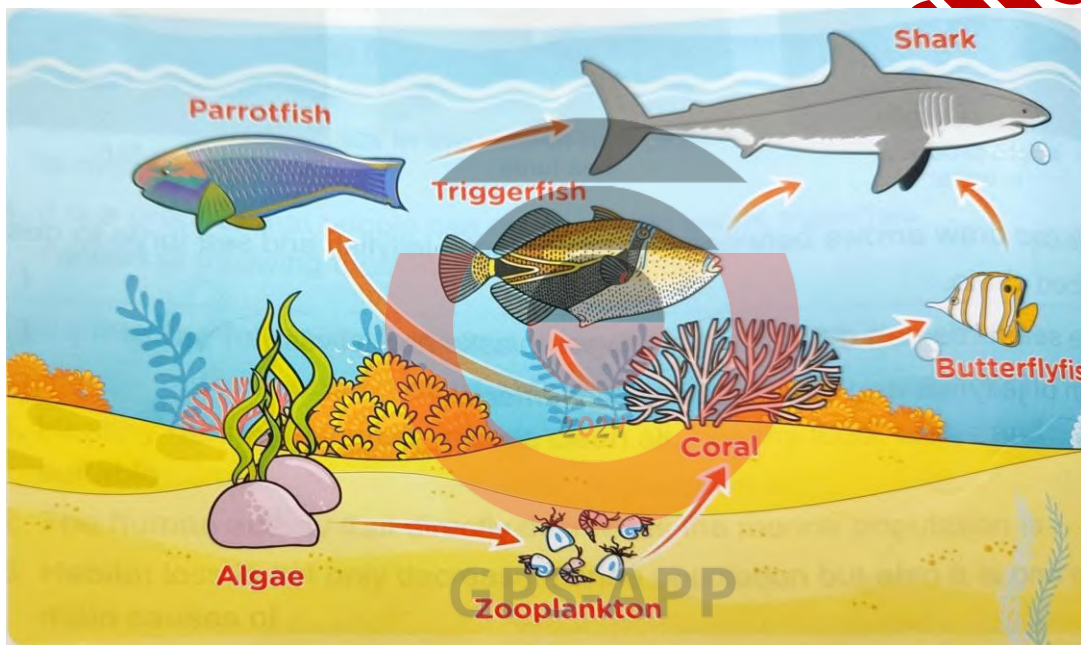
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## Lesson (5)

### Impact on a food web

➤ **The importance of coral in Marine food webs :**

- ✓ Food for a variety of primary consumers.
- ✓ Shelter for many organisms in the sea.



➤ **If the coral reefs disappeared the marine ecosystem will be destroyed. ( G.R )**

- ✓ Because the parrot fish, tiger fish and butter fly fish will not have nothing to eat so they will die.
- ✓ The shark will find a small amount of food to eat so it will die.
- ✓ The algae that live in coral tissues will lose their habitats.



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## Worksheet (5)



• **Put ( ✓ ) or ( x ) :**

- 1- If coral reefs are destroyed, many marine food chains will be destroyed. ( )
- 2- Primary consumers and predators in seas and oceans are negatively affected by rising water temperature ( )
- 3- Coral reefs depend on butterfly fish for food and shelter. ( )

• **Choose the correct answer:**

- 1- Coral reefs Are considered as resources of .....  
A) Food only.  
B) Shelter only.  
C) Food and shelter.  
D) Food and pollution.
- 2- Algae in coral reefs provide food for ..... directly.  
A) Primary consumers.  
B) Second consumers.  
C) Producers.  
D) Predators.
- 3- Coral reefs bleaching negatively affects ..... directly  
A) Parrot fish only.  
B) Tiger fish only.  
C) Butterfly fish and sharks.  
D) Parrot fish and tiger fish.



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## Lesson (6)

### Habitat Restoration

**Habitat Restoration:** it is the process of returning a habitat back to its natural state before harm was done.

Habitat Restoration projects try to repair all parts of the habitat.

Most of habitat restoration projects require a lot of work and take a long time.

#### ❖ **Example :**

**Rebuilding coral reefs:** (a coral reef rehabilitation project)

✓ scientist collect small parts of different coral species and then move them to a nursery.

➤ **Nursery:** is an area in the sea, where scientists take care of small pieces of coral until they grow up.

➤ **Protecting coral reefs from plastic pollution:**

In Egypt, coastal communities near the coral reefs applied a new way of life known as a (zero plastic) where people can:

✓ Replace plastic forks with wooden ones.

✓ Replace plastic bags with cloth ones.



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## Worksheet (6)

### • Put (✓) or (x) :

- 1) Citizens must share in returning a habitat back to its healthy conditions before harm was done ( )
- 2) Nursery is a natural habitat in the sea, in which coral reefs continue growing and reproducing ( )
- 3) People near the coastal areas must replace plastic bags with cloth one. ( )

### • Write the scientific term of each of the following:

- 1- It is an area in the sea, where the scientists take care of small pieces of coral until they grow up. ( )
- 2- A process of returning a habitat back to its natural state before harm was done. ( )

### • Choose the correct answer:

- 1- Habitat Restoration projects allow scientists to .....that occur to an ecosystem.
  - A) Increase harms.
  - B) Decrease harms.
  - C) Keep harms.
  - D) Increase damage.
- 2- The place in which we can take care of small pieces of coral until they grow up is known as .....
  - A) Food chain
  - B) Food web
  - C) Grassland
  - D) Nursery
- 3- All the follow processes show coral reefs in healthy conditions, except.....
  - A) Growing
  - B) Bleaching
  - C) Reproducing
  - D) Filtration



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4- Zero plastics projects that is applied in Egyptian coastal communities, means that the using of plastic products decreases by .....

- A) 0%
- B) 10 %
- C) 90 %
- D) 100%

• Give reasons for :

It is better to keep natural resources healthy than applying restoration projects.

.....

.....

.....

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## UNIT (2) CONCEPT 2.1 LESSON.1

### MATTER

#### -Matter:

It is anything that has a mass and takes up space (has a volume)

#### States of water:

##### 1-Gas state:

Such as: Air- Water vapor(steam)- Carbon dioxide- Oxygen



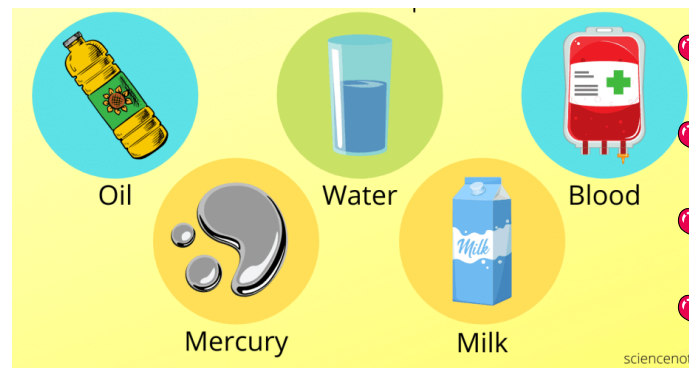
##### 2-Solid state:

Such as: Ice- Gold- Wood



##### 3- Liquid state:

Such as: Oil- Water- Milk- Vinegar



Note: -Water can be found in the three state.

-To describe any matter, we must know it's properties like:  
shape ,volume, color, hardness and texture.

### Properties of matter include:

#### 1-Color:

-One color



-Many color

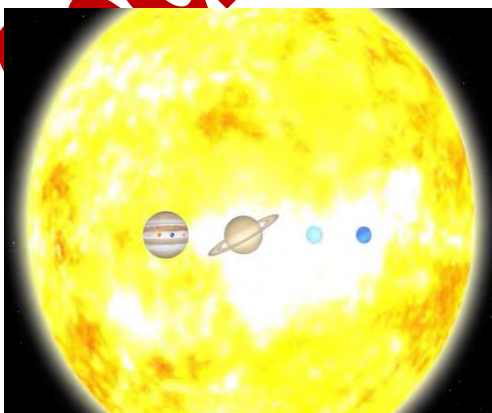


-Colorless (no color)



#### 2- Size (volume):

-Big  
them



+ Small

Tiny that you can't see

Such as germs



### 3-Temperature:

Property of matter by which we can distinguish between hot and cold).

#### Hot



#### Cold

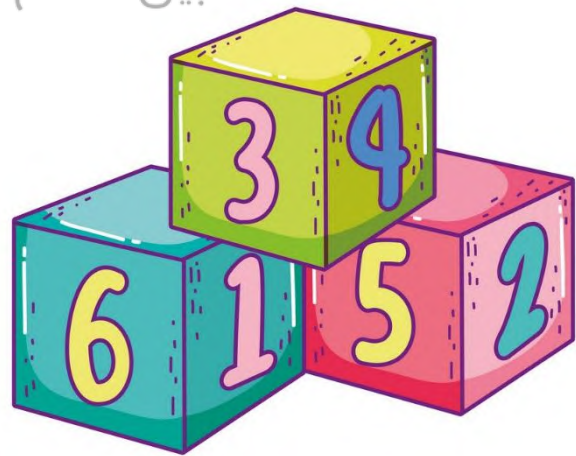


### 4-Shape:

#### Round



#### Square







## 5- Hardness:

Property of matter by which we can distinguish between hard and soft.

-Hard like a brick

-Soft like a feather.



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## Worksheet (1):

### Q.1- Write the scientific term of each of the following:

1-Property of matter by which we can distinguish between hard and soft (.....)

2-The state of water after its boiling (.....)

### Q.2- Choose the correct answer:

1-Matter can be found in.....States.

a.8    b. 2    c.3    d.1

2- The amount of space that a matter takes up is called.....

a. volume    b. mass    c. area    d. weight

3-Both ..... and ..... have the same state of matter

a. oil-plastic.    b. wood-water.    c. iron-milk.    d. wood-plastic

4-water can be found in a solid state in the form of.....

a. sea water    b. steam    c. ice    d. boiling water

### Q.3-what happen if.....?

Water is frozen in the freezer (according to the state of water after freezing.

.....

## Lesson (2) Observing Matter



- **Solids:** Have definite (fixed) volume and shape.
- **Liquids:** Have definite volume but they don't have definite shape so, they take the shape of their containers.
- **Gases:** Definite no volume and shape, so they take the volume and shape of their containers.

### The particles of all Matter

#### 1-Particles of solid matter:

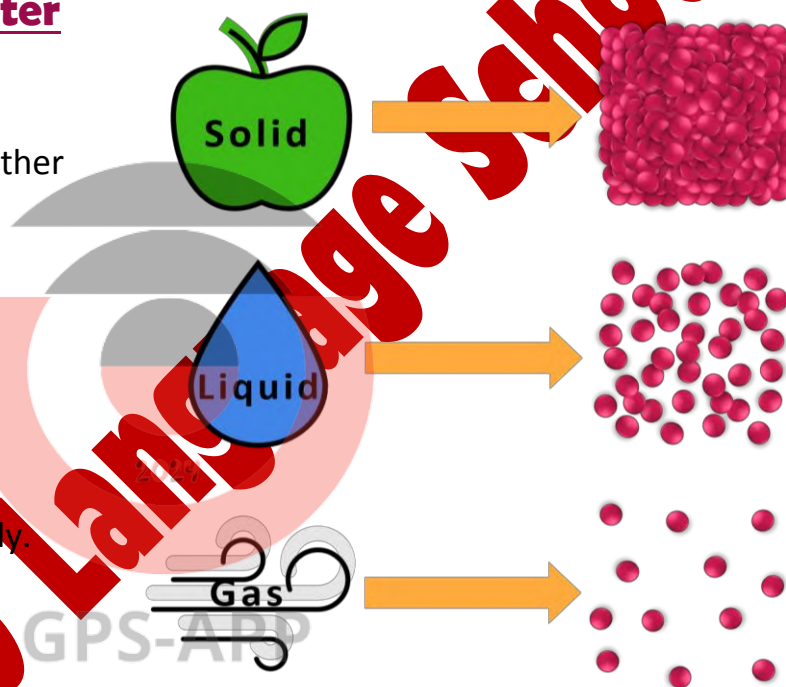
- They are very close to each other (packed tightly).
- They have less energy.
- They move only a little bit.

#### 2-Particles of liquid matter

- They have more spaces.
- They have more energy
- They can move more freely.

#### 3-Particles of gases matter

- They have a lot of spaces.
- They have a lot of energy
- They move very freely



**Note:** There are some things that are not matter as light and sound which are forms of energy.

### Notes:-

We can measure the length of some matter using **ruler** or **measuring tape**.

- We can measure the mass of matter using **a scale**.
- Matter can change from one state to another such as from solid to liquid by melting, from liquid to solid by freezing.



Worksheet (2)Q.1-Give reasons for:

1- Oxygen has no definite shape or volume.

.....

2- Stone has definite shape and volume.

.....

3- Vinegar is a liquid matter.

.....

Q.2-Put (✓) or (X) and correct the wrong ones:

1. All forms of matter have volume. (     )

.....

2. Liquids don't take the shape of the container that they are placed in. (     )

.....

3 Both oil and wood have definite shape. (     )

.....

4. On transferring water from one pot to another, its volume will change. (     )

.....

5. Light and sound are forms of matter. (     )

.....

Q.3- Choose from column (A) what suits it in column (B):

| A                 | B  |
|-------------------|--|
| 1. Gasoline       | a) Its particles have medium energy. (     ) |
| 2. Carbon dioxide | b) Its particles are packed tightly. (     ) |
| 3. Sand           | c) Its particles do not at all. (     )      |
|                   | d) Its particles move freely. (     )        |

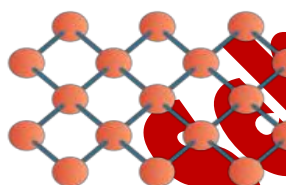
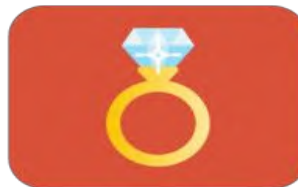
## Lesson (3)

### States of Matter

#### 1-The shape of solids matter:

- ❖ They have a definite (fixed) shape.
- ❖ Their shape do not change unless  
Something is happening to change them.

Diamond

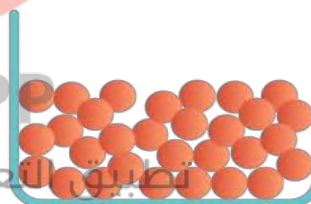


Atoms in a solid

#### 2-The shape of liquids matter:

- ❖ They do not have definite shape.
- ❖ They take the shape of their  
containers.

Glass of Juice

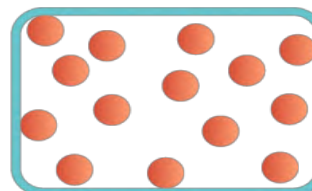
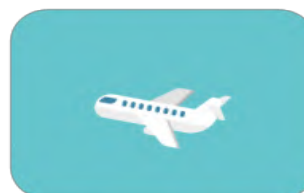


Atoms in a liquid

#### 3-The shape of gases matter:

- ❖ They do not have definite shape.
- ❖ They completely fill their containers  
and take their shapes.

Air



Atoms in a gas

## What is Matter?

Matter is something that you can:

1-Feel:

Such as: Air



2- See:

Such as: Pencil



3- Smell:

Such as: Flower





## ➤ Particles of Matter

### ➤ Particles of solids:

**They are packed closely together, so:**

- They vibrate or move around their place.
- They cannot move from one place to another and cannot slide over each other.

### ➤ Particles of liquids:

**They are held more loosely, than particles of solids, so:**

- They move faster than solid particles.
- They can slide over each other so, they take the shape of their containers.

### ➤ Particles of gases:

**They are not held together, so:**

- They move very quickly in all directions.
- they can spread out to fill up any container they put in.



**Solid**



**Liquid**



**Gaseous**

## Worksheet (3)



### Q.1-Cross out the odd word:

- 1- Steam- Oxygen- Gasoline- Air (.....)
- 2- Vinegar- Aluminium- Gold- Wood (.....)
- 3- Ball- Air- Pencil- Table (.....)

### Q.2- Complete the following sentences:

- 1- .....are known as the building units of matter.
- 2- Particles of ..... are held more loosely, than particles of solids.
- 3- The shape of ..... do not have definite shape.
- 4- Matter is something that you can....., ..... and .....  
.....
- 5- Particles of .....move very quickly in all directions.

### Q.3-What happens if.....?

Solid changes into liquid. (according to the speed of particles)

.....

## Lesson (4)

### ❖ Modeling the particles of matter :

- Using model is away to some scientific concept than can make ideas more clear.

Example:

► When a cup of ice cubes exposed to the Sun in a hot summer day :



The Sun will heat up the particles of ice cubes.



The particles of ice cubes move faster and turned into liquid water.



The Sun heats up the particles of water so, they move faster and the water will evaporate.

- Objects that are too small such as germs or too large such as solar system can be studied easily when using model.
- You can use these balls to describe the movement of particles of the three states of matter.



Ping pong ball

Note:

- When you heat a solid matter ,the movement of its particles becomes faster.





- By heating a liquid matter it changes into gas matter.
- Particles of solid are organized and have a regular pattern.

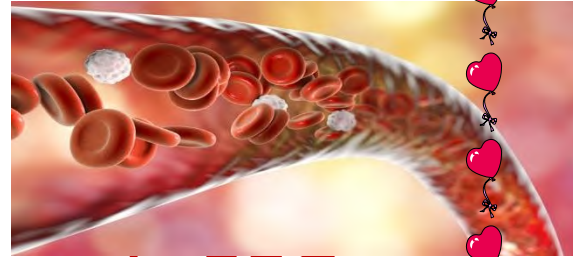
The size of particles depends on :

- 1- The type of particles.
- 2- How particles connect each other.

To see the components of one particles such as

One blood cell, scientist cannot use the regular microscope , but the use special microscope

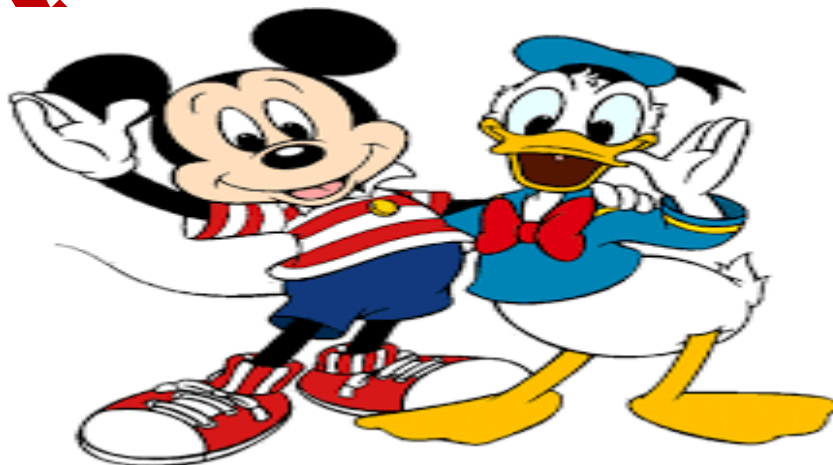
Called { Electron microscope }



Electron microscope

Note: Size of particles depend on :

- 1- The type of particles.
- 2- How particles connect with each other.



## How can we show the particles exist ?

We can use gas matter such as air which is made of invisible tiny particles as follow:

| When you blow up a balloon  | When you squeeze a balloon  |
|---|---|
| <ul style="list-style-type: none"> <li>- The particles of air inside the balloon move very quickly</li> <li>- The particles of air hit and bounce the balloon from inside, so they produce a force that inflates the balloon and gives it a round shape.</li> </ul> | <ul style="list-style-type: none"> <li>- The particles come close together so, the balloon becomes smaller</li> <li>- If you squeeze more on the balloon, it will pop and the particles of air inside the balloon will escape.</li> </ul> |
|    |   |

## Worksheet (4)

**Q.1) Choose the correct answer :**

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1- By changing the .....of a matter, its state may change.

- a. mass      b. volume      c. Color  
d. temperature

2. If water is exposed to high temperature, its particles will move....., and the water may change into....

- a. faster-ice.      b. faster-water vapor.      c. slower-ice      d. slower-water vapor

3- We can use a model to study very large things such as

- a. solar system.      b. germs.      c. microbes.      d. viruses

4. By blowing up a balloon, ....

- a. its volume decreases.      b. its color changes.      c. its volume increases.  
d. its mass doesn't change.

5. To examine the structure of tiny particles of a matter, we can use....

- a. ruler.      b. balance.      c. thermometers.      d. microscopes.

### Q.2) Give reason for:

1- Some times we need to use an electron microscope.

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2- Using model to study some scientific concept.

### Q.3) What happen to.....?

➤ The size of a balloon when you blow it up







## Lesson (5)

### ❖ Models

Models help us understand things we cannot easily see such as :

- We cannot see the Earth which is too big while we are standing on it. But, we can observe and understand it using the model of globe shown the previous picture.

#### Model:

It is a copy that is similar to a real thing.

How model help us look at big things?

Example:

**The Earth :**

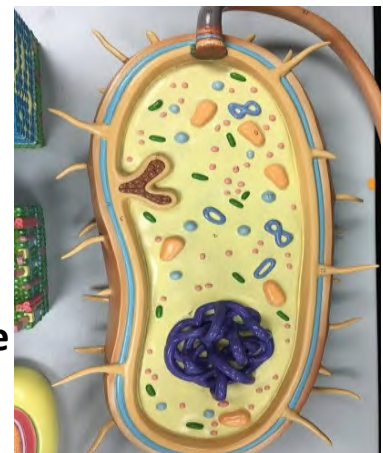
A globe represents a model of the Earth which shows us :

- The shape of the Earth
- How much of the Earth is covered with water.
- where different countries are located.



How model help us look at small things?

Models can represent very tiny thing in abigger size because It is hard to see them





Germes are very tiny and they are spread around us which make us sick

- A model of a germ helps us to :
  - See the shape of a germ without microscope.
  - See different parts of germs which help them to know how to spread from one person to another.

## Models help us understand how things work

Example : A model of a volcano:

A model of a volcano shows us :

- The shape of a volcano.
- How the liquid that comes out of a volcano



during a real eruption.

## Modeling States of Matter

The arrangement of particles in:

- Solid matter: They have a regular pattern (organized).
- Liquid matter: They have a random arrangement (not well organized).
- Gas matter: They have a random arrangement (not organized at all).



### Note:

Globe : Model of the whole world that is made in the shape of large ball.



## Worksheet (5)

### Q.1) Choose the correct answer:

1. The model of the Earth shows how much of its surface is covered with .....  
a. gasoline.                      b. water.                      c. milk.                      d. animals.
2. We can see all planets of the..... system including the Earth by using a model.  
a. solar                      b. digestive                      c. respiratory                      d. muscular
3. Some liquids come out of a ..... during its eruption.  
a. star                      b. wooden piece                      c. volcano                      d. plastic piece
4. Particles of ..... are organized and have a regular pattern.  
a. solids only                      b. gases only                      c. solids and liquids                      d. liquids and gases
5. Gases differ from solids and liquids in that gases.....  
a. can be poured.                      b. have a definite shape.  
c. fill any container they are put in.                      d. have a definite volume.

### Q.2) Write the scientific term of each of the following :

- 1- A model of the whole world that is made in the shape of a large ball  
(.....)
- 2- A copy that is similar to a real thing which we cannot observe with our eyes.  
(.....)





Q.3) Complete the following sentences :

- 1- Water vapor particles are loosely packed, so that water vapor do not have a definite ..... Or.....
- 2- We can study the location of countries by using a ..... which represents a model of the Earth.
- 3- Liquids that come out of a volcano have definite ..... but they have no definite..... .

Q.4) Give a reason for the following :

- Both liquids and gases don't have a definite shape and take the shape of their containers.

Q.5) What happens to ... ?

The arrangement of particles of water after its freezing.

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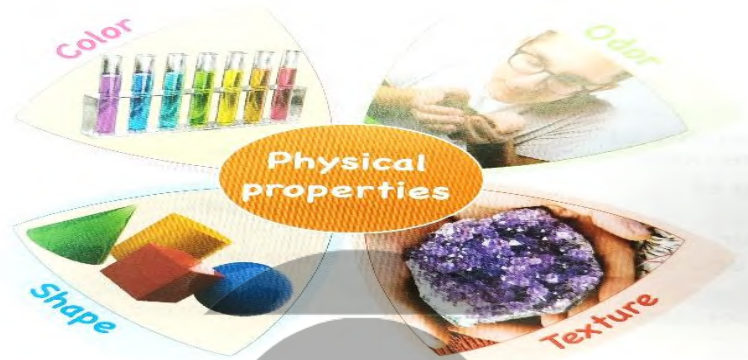
## Concept (2.2) Lesson (1)



### Describe and measure matter

How is matter described and measured?

1-By its color , shape ,texture, size.



2-By its state whatever it is solid , liquid ,gas.



1. We can measure some properties of matter using some tools like :

1-Balance to measure it's mass.



2-Ruler to measure the length.



3- Thermometer to measure the temperature.



- a roof for every type of climate



| Environment   | Material of the roof                   | Properties of roof material   |
|---|--|---|
| <p>Desert home</p>                 | Made of strong stones                  | <p>-It's flat.</p> <p>-It protects the home from dust and dirt.</p>             |
| <p>Cold weather home</p>          | made of ceramic tiles (ceramic bricks) | <p>-It's slanted (inclined).</p> <p>-It protect the home from rains.</p>        |
| <p>Tropical rainforest home</p>  | Made of leaves and sticks              | <p>-It's slanted.</p> <p>-It protects the home from animals getting inside.</p> |

**Note:**





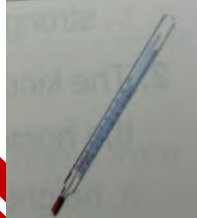
The type of material used to make a roof depends on the climate where the home is.

Everything around us is made of matter.





Measuring matter: each property of material can be measured by using special measuring tool, like the following table

| volume  | Length  |   | mass   | temperature   |
|---|---|---|--|---|
|  |  |  |  |  |
| Measuring cup   | Measuring tape  | ruler   | balance  | thermometer   |

You may need to measure more than one property of material to determine if this material is the right one to use.

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## Worksheet (1)



### Q.1) Put True or false:

- 1) The desert home roof made of leaves and sticks. ( )
- 2) Roofs of buildings protect them from rain, animals, dust, dirt, and other things getting inside. ( )
- 3) The tropical rainforest home has flatten roof ( )
- 4) we can describe solid matter by it's color and shape. ( )

### Q.2) Choose the correct answer:

- 1) The roof of desert home is made of .....  
 A-ceramic tiles                      b-strong stones                      c-leaves and sticks                      d-ceramic bricks
- 2) The type of material used to make roof depends on the .....where the home is located .  
 a-height                      b-climate                      c-location                      d-roof
- 3) You can use ..... to measure the mass of the matter .  
 a-measuring tape                      b-balance                      c-ruler                      d-thermometer
- 4) You can use a ruler to measure the .....of your book.  
 a-length                      b-mass                      c-temperature                      d-volume

### Q.3) Write the scientific term:

- 1) A material that is used to build the roof of cold weather homes.(.....)
- 2) The property of matter that is measured by measuring cup.(.....)
- 3) The property of matter that is measured by the balance.(.....)
- 4) The property of matter that is measured by the measuring tape.(.....)



**Q.4) Choose from (A) what suits (B)**

| Column A  | Column B  |
|---|---|
| 1-thermometer.<br>2-ruler<br>3-balance<br>4-measuring cup | a-Is used to know the length of a book.<br>b-Is used to know the mass of some apples<br>c-Is used to know the temperature of hot cup of tea.<br>d-Is used to know the volume of amount of water.<br>e-Is used to determine the shape of a book. |

1.....

2.....

3.....

4.....

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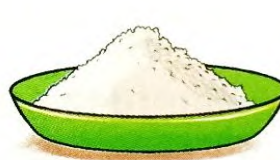
## Lesson (2)



### The case of the kitchen mystery

Examine 4 different materials like (sugar, salt, flour ,unknown mixture)

★ Check their texture with your hands , smell their odor ,and examine them with a lens.(you will find the following observations)



1- All substances have the same color.

2- The substances have different odors.

3- The substances are made up of:

a- Large crystals as in sugar.

b- Small crystals as in salt.

c- Very fine particles as in flour.

d- A mixture of large and very fine particles as in unknown mixture.

The unknown mixture is a mixture of sugar and flour.

**So :** color , texture , odor , shapes are some properties of the matter that are called physical properties.

Note:



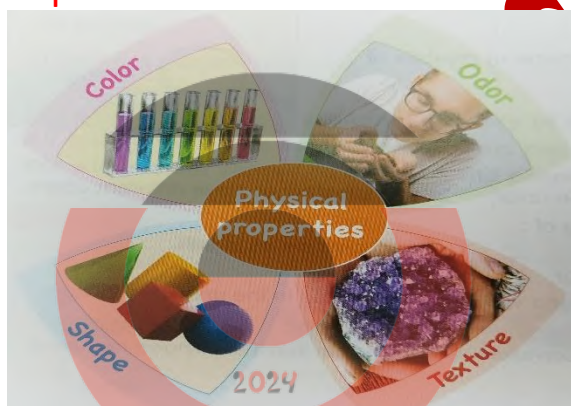
Physical properties:

Properties of matter which you can observe them by using your five senses.

-we can use words such as rough ,blue,round and sweet to describe the physical properties

Properties of matter.

First: physical properties are observed with the five senses like:



1-color

2-odor

3-texture

4-shape

Second: chemical properties are observed and measured by the changes that happen in the material when it interacts with the other materials like:



The ability to burn: like the paper interact with fire , the paper becomes ash.





**The ability to rust :** like the iron nail interacts with water and air , the iron rusts.



| Volume  | Mass  |
|---|---|
| It's the amount of space the matter takes   | It's the measure of the amount of matter  |
| <b>The measuring units of volume are :</b><br>-liters(L)<br>-Milliliters(mL)<br>-cubic centimeter( $\text{cm}^3$ )                      | <b>The measuring unit of mass are :</b><br>-gram(gm)<br>-kilogram(kg)   |
| $1\text{L} = 1000 \text{ ml} = 1000 \text{ cm}^3$   | $1\text{kg} = 1000 \text{ gm}$  |
| A big bottle of water contains 1 liters or more.<br> | A paperclip has a mass of 1 gm<br> |



## Volume and mass:

1 liter of water has a mass of 1 kg.



## Temperature

### Temperature:

is a measure of how quickly the particles move in the matter.

1-Quickly moving particles produce more heat energy than slower moving particles. تطبيق التعلم التفاعلي عن بعد

2-Volume , mass and temperature are properties of matter that you can measure.



## (Worksheet 2)



### A) Choose the correct answer:

1-all of the following are physical properties of matter except.....

(a-color                      b-rusting                      c-texture                      d-shape)

2-the physical property of milk that you can see is the .....of it.

(a-odor                      b-texture                      c-color                      d-taste)

3-burning of wood is considered as .....of matter.

a- physical property                      b-chemical property  
c- physical and chemical properties                      d-neither physical or chemical properties

4-the volume of one liter of water has a mass of .....

(a- 1 gm                      b-1 kg                      c- 1 mL                      d-1cm<sup>3</sup>)

### B) true or false:

1- Salt and sugar have the same color and odor.(                      )

2-we can differentiate between sugar and flour by texture only. (                      )

3-shape is one of chemical properties of matter.(                      )

4-all physical properties of matter can be measured.(                      )

### C) Write the scientific term of each of the following :

1-it's the measure of the amount of matter (.....)

2-it's the amount of space taken by the matter (.....)

3-it's the measure of how quickly the particles in a matter are moving (.....)

4-the properties of matter that you can observe them by using your five senses (.....)



**D) complete the following by using the words below:**

( physical      - odor      -rough)

1-Both odor and texture of matter are considered from the

.....properties of matter.

2-You can know the .....of a juice by using the sense of smell.

3-We can describe the texture of sugar crystals by saying” it has

.....crystal texture”

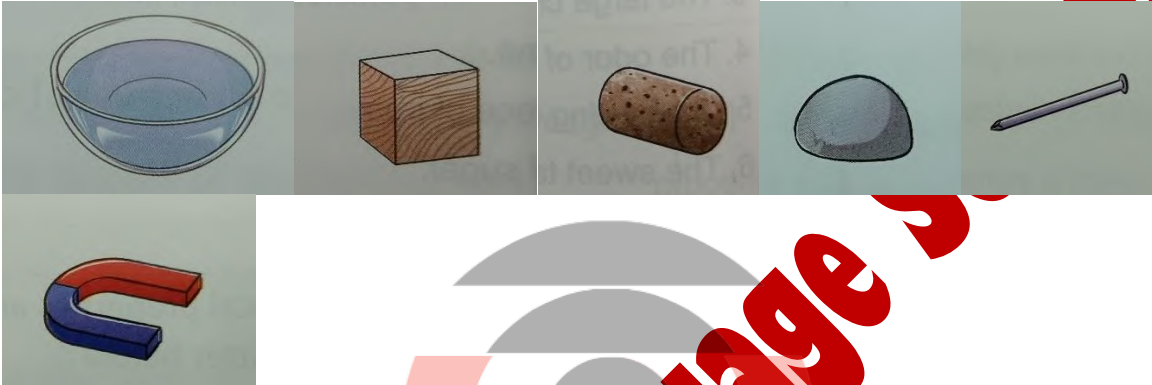




## Lesson (3)

### Activity 9: measuring properties

use a basin filled with water ,magnet ,balance ,stone ,iron nail ,wood ,cork

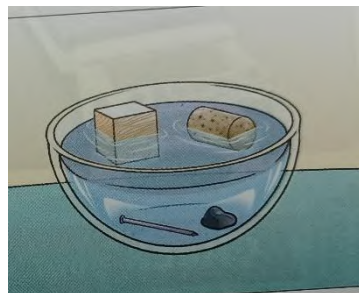


1-Hold the magnet near to each substance and see what substance is attracted to the magnet .

2-Measure the mass of each substance by the balance .



3-Put all substances in the basin of water and see which will float and which will sink.





1-Some substances are attracted to the magnet and some doesn't.

2-Floating and sinking doesn't depend on the mass of the matter.

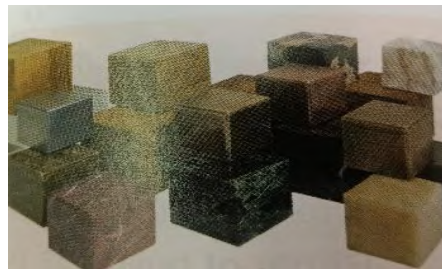
3- Changing the shape of the material doesn't affect its mass.

If you cut an apple in two halves and measure the mass of one half, the mass would be half the mass of the original apple.



### Activity 10: measuring matter

In front of you 3 materials, see the data of each one then compare between them:



1 is biggest in mass but not the largest in volume.

2 have the largest volume but not the biggest mass.

3 is the longest one

## Worksheet (3)



### A)choose the correct answer:

1-the mass of an orange will change if we its .....

(a- size only      b-size and shape      c-shape only      d-color and shape)

2-if we cut a tomato into 2 halves , the .....of one half of tomato will decrease to half.

(a-color      b-mass      c-temperature      d-shape)

3-1kg of tomato will differ from 1kg of wood in the .....

(a-volume      b-volume and mass      c-mass      d-color and mass)

4-which of the following matter floats on the surface of water?

(a-iron spoon      b-stone      c-iron nail      d-cork)

### B>true or false:

1-iron spoon is attracted to the magnet.( )

2-if we put a wood cube in water it will float.( )

3-iron nail is attracted to the magnet and floats on the surface of water.( )

4-if we cut an apple into 4 pieces , the mass of each piece is less than the whole apple( )

### D)complete the following phrases from the words below:

(mass \_ iron \_ attracted \_ doesn't attract \_ cotton\_ floats\_ sinks)

1-a spoon of wood .....to the magnet and .....on the surface of water.

2-an iron ruler .....in water, and .....to the magnet.



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3-if an iron cube and an amount of cotton have the same mass, so the volume of .....

is smaller than that of the .....

4- if you eat a small piece from a banana ,so the .....of the remained piece of banana will decrease.

**D) what happens when:**

1-A magnet is put close to an iron nail and a plastic cup?

2-A piece of cork is put in water?

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## LESSON (4)

## Useful Properties of Matter

- Look at the following picture, then put (✓) or (×)

1. Cooking pans are made up of copper. ( )
2. . Handles of cooking pans are made up of wood or plastic . ( )

- In this activity we will learn about the useful properties of some materials .



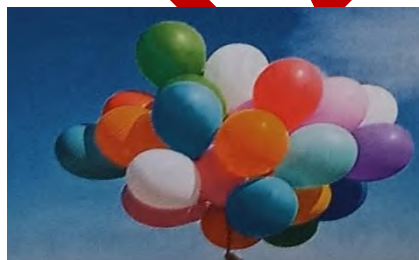
## Helium

## Properties of helium

| Physical properties                                   | Chemical properties  |
|---|--|
| It is a light gas which means it is lighter than air. | It is not poisonous.<br>It is not flammable (A flammable material means that this material burns and form fire). |

## Uses of helium

It is used to fill balloons



It is used to fill blimps



Give reason for :

Balloons and blimps filled with helium always rise up in the air.  
Because the helium is lighter than air.



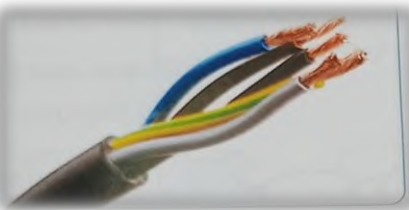
## Copper

### physical properties

- It can be stretched into thin, flexible wires.
- It Conducts electricity well (good conductor of electricity).
- It conducts heat well (good conductor of heat).

### Uses of copper

It is used in making electrical wires



It is used in making cooking pans



### Give reason for:

Electric wires are made up of copper.

Because copper is a good conductor of electricity and can be stretched into a thin, flexible wire.

### Note

Wood and plastic are bad conductors of heat so, they can be used in making handles of cooking pans.

### Check your understanding

- Look at the following figures, then answer the questions

Copper handle



Figure (a)

Wooden handle



Figure (b)

1. In which figure the hand will feel heat.  
The cooking pan is made up of.....

(Figure (a) - Figure (b)  
(wood - copper)





- You have learned a lot about the properties of a materials  
**now**, we will learn about some uses of some other matter.
- The following table shows some uses of some matter and its properties.

| Types of Matter | Uses (purpose)   | Property  |
|-----------------|--|---|
| Steel           | <br>Screwdrivers      Hammers  | <ul style="list-style-type: none"> <li>• Hard</li> <li>• Strong</li> </ul>          |
| Glass           | <br>Windows      Eyeglasses   | <ul style="list-style-type: none"> <li>• Transparent</li> <li>• Smooth</li> </ul>   |
| Rubber          | <br>Tires      Gloves<br><br>Athletic shoes | <ul style="list-style-type: none"> <li>• Water proof</li> <li>• Flexible</li> </ul> |

## Check your understanding

- Complete the following sentences :

1. Among the properties of rubber are water proof and.....
2. . Hammers are made up of.....



## Worksheet 4

### 1 (A) Choose the correct answer:

- The used materials in making cooking pans are.....  
 a. copper and glass  
 b. copper and helium.  
 C. glass and helium.  
 d. copper and wood
- Both..... are sinking in water and attracted to the magnet.  
 a. stone and iron nail  
 C. paper clip and wood spoon  
 b. paper clip and iron nail  
 d. plastic ruler and wood spoon
- 1kilogram of iron = 1 kilogram of cotton This sentence means that both materials are equal in.....  
 a. mass only  
 C. volume and mass  
 b. volume only  
 d. mass and temperature.

### (B) Give a reason for the following :

Glass is used in making eyeglasses.

.....



## Part 1

### 2 (A) Cross out the odd word:

1. Shape - Mass - Rusting - Color.
2. Kilogram - Liter - Cubic centimeter – Milliliter
3. Piece of wood - Iron nail - Piece of cork - Piece of stone

### (B) What happens if.....

You put a piece of cork in a beaker filled with water.

.....

### 3 Look at the following pictures, then complete the following sentences;

Tool (A)

Tool (B)

Tool (C)



1.  
Tool

(.....) is made of steel, because it is.....And.....

2. Tool (.....) is made of rubber, because it is.....And.....

3. Tool (.....) is made of glass, because it is.....And.....





# 1 (A) Choose the correct answer:

- Mass is a measurement of the.
  - odor of flower.
  - length of wood bar.
  - amount of flour
  - color of apple.
- We can define volume as the amount of..... that matter takes up
  - space
  - temperature
  - time
  - water
- From the people which use balances in their works are.....
  - cartographers.
  - pale ontologists.
  - bakers
  - space scientists.

## (B) Give a reason for the following:

Cartographers create marine charts:

## 2 (A) Put ( ) or (x) :

- Air is a matter so it has mass.
- The ability to rust is one of the physical properties of matter.
- Cartographers can measure the mass of the Earth planet.

## (B) What happens if.....?

you touch a handle of a cooking Dan made of cooper and putted on gas oven.

3 Look at the following figures, then complete the following sentences using the words below:

(meter - mass - kilogram - architects - length- bakers)

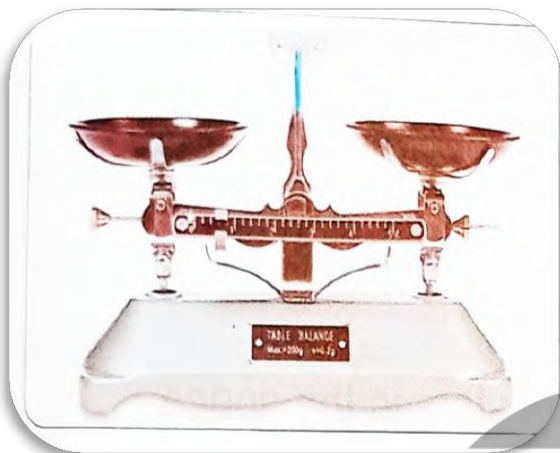


Figure (1)

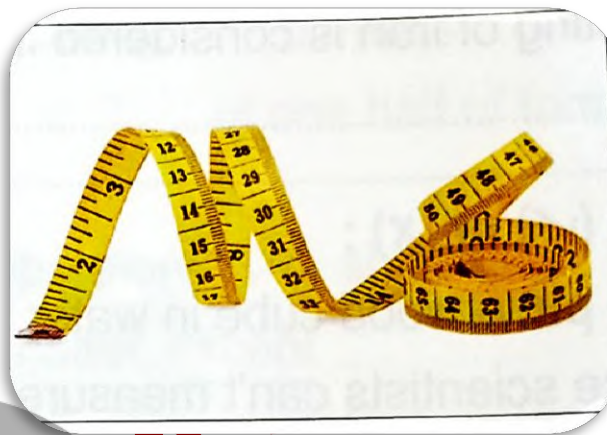


Figure (2)

1. Tool in figure (1) is used to measure..... and its measuring unit is.....
2. Tool in figure (1) is used by..... in their work.
3. Tool in figure (2) is used to measure..... and its measuring unit is.....  
Tool in figure (2) is used by..... in their work.



- Look at the following picture, then answer the question :

To measure the length of this fish we can

Use.....

( ruler - balance - measuring cup)

### Careers and Measuring Matter

You have learned in the previous lessons how to measure some different materials.

- In this activity we will learn about the importance of measuring matter in different careers or jobs.

### Architects and builders

- They carefully measure materials when building homes and schools because they must know correct lengths and widths of boards before building walls.
- Knowing the properties of materials and the correct measurements help architects and builders to build up safe buildings.

### Bakers

Bakers must measure the volume and mass of ingredients before start baking.

### Example;

If too much or too little baking powder is used in baking a cake, the bakers could not make a good cake.








## Scientists

Scientists often measure matter during their researches.

The following table shows some measurements that different scientists do:

| Paleontologists   | Space scientists  | Marine biologists   |
|---|---|---|
| Measure the size and shape of fossils.  | Measure the mass of planets and stars.  | Measure the speed of Sound produced from animals such as whales and dolphins.       |
|  |  |  |

### Note

Scientists must use accurate measurements when they do experiments or researches.

## Cartographers

- They are responsible for measuring and mapping Earth's surface.
- Maps can give us information about climate and topography (that studies mountains, lands, seas oceans, ... etc. on the Earth's surface).

The role of cartographers

- 1) They create city maps to help tourists find their way.



- 
- The left image is a map of Egypt, showing the Nile River, major cities like Cairo, Alexandria, and Luxor, and surrounding countries like Sudan and Libya. The right image is a photograph of the planet Mars, showing its reddish-brown surface and polar ice caps.

- 




Put (✓) or (×):

1. Architects and builders don't measure materials when they build homes. ( )
2. Paleontologists measure the size and shape of fossils. ( )
3. Biologists develop city maps to help tourists find their way. ( )

## Concept (2.3) L.1 States of matter

States of matter are: solid , liquid and gas.



| P.O.C    | Solid   | Liquid  | gas  |
|----------|---|---|--|
| Shape    | definite (doesn't change)<br>(they are hard)  | Don't have definite shape(<br>takes the shape of container)   | Don't have definite shape(<br>takes the shape of container)  |
| Volume   | Definite (doesn't change)   | Definite (doesn't change)   | Don't have definite volume (<br>takes the volume of container)   |
| Examples | Ice, wood and iron<br> | Water, milk and oil<br> | Oxygen, water vapour and carbon dioxide<br> |



- Matter can be changed from state to another by **cooling or heating** but the mass ( amount ) and number of particles don't change .
- Water exists in three states: ice (solid state ) , water (liquid state ) and water vapour (gas state).
- When you leave piece of chocolate in sun or cube of ice in a hot place they will melt and change from **solid** state to **liquid** state.



**Melting :** Process in which the matter is changed from solid to liquid state when its temperature increases by heating.

- We use Thermal energy (heat energy ) in cooking food and warming homes.
- Any matter consists of very small particles, these particles are always in motion, vibrate and spin around .

Particles of matter

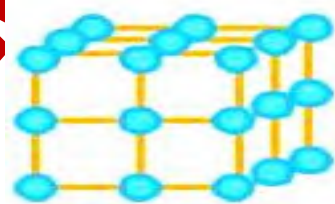


move, vibrate, spin faster and spread out



The matter become warmer

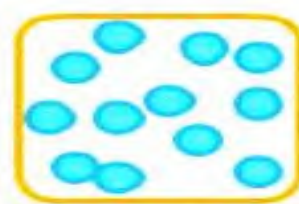
## States of Matter



SOLID



LIQUID



GAS

ADD HEAT

## Worksheet (1)



### Q.1) Choose the correct answer:

1-Ice turns into water by.....

a- cooling

b-freezing

c-rusting

d-heating

2-Which of the following matter takes the shape and the volume of container?

a-water.

b-juice.

c-ice.

d-water vapour

3-All the following happen to the particles of oil when it is cooled ,except that they.....

a-move slower

b-move faster

c-vibrate less

d-come close together.

### Q.2 ) Put (√) or ( x ):

1-The mass of an amount of apple juice will change if we mix it with water. ( )

2-Particles of solid matter are spread out from each other. ( )

### Q.3) Write scientific term

1-The state of matter in which matter takes the volume and the of its container. ( )

2-It is a process by which a matter is changed from solid to liquid state. ( )

### Q.4 )Complete the following :

1-Iron is a .....state of matter that has definite .....and.....

2-The distance between particles of solid matter is very .....

**Q.5) Give reason for :**

1-Ice is turned into water when it is placed in a warm room.

.....

2-Air doesn't have definite shape and volume.

.....

.....

**Q.6) What happens if:**

1-.we cool some of tomatoes. (According to their masses)

.....

2- We heat an amount of water. (according to the motion of particles)

.....

**Q.7) Look at the following pictures ,then complete the following:**



Picture (1)



Picture (2)



Picture (3)

1. Picture (.....) is considered as a solid matter because .....

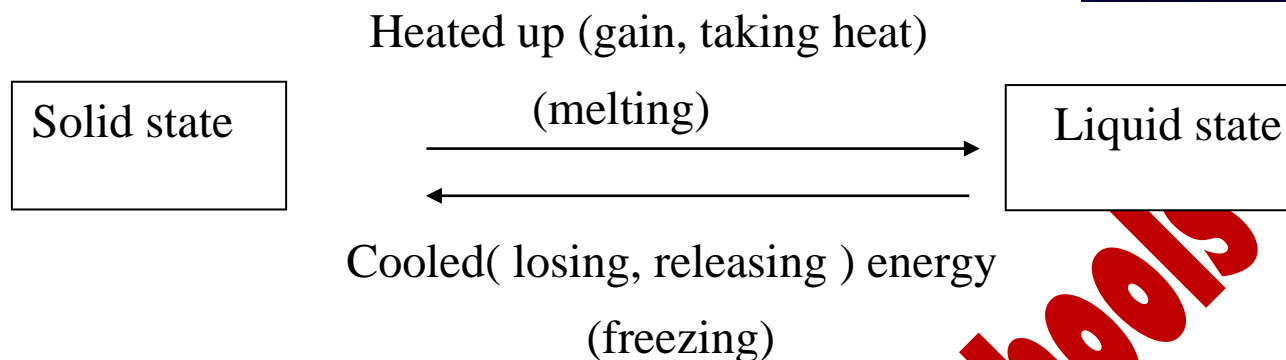
2. Picture (.....) is considered as liquid matter because .....

3. Picture (.....) is considered as gas matter because .....

4. Picture (.....)  $\xrightarrow[\text{Process}]{\text{Melting}}$  picture (.....).



## Lesson (2) Changing states of matter



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- When melting chocolate it's taste, color and smell don't change .  
(example on physical change)

**Physical change:** it is a change in matter without any change in its structure(make up).

- When the temperature of ice increases above  $0^{\circ}\text{C}$  it changes into liquid water.
- $0^{\circ}\text{C}$  is called freezing point of water.
- $^{\circ}\text{C}$  is the measuring unit of temperature.

Worksheet (2)



**Q.1 Choose the correct answer:**

1-freezing of liquid chocolate needs.....temperature.

- a)high                      b)low                      c)warm                      d)very high

2-The reversible changes of matter are usually .....

- a) physical changes only.  
b)chemical changes only .  
c)both physical and chemical changes.  
d)neither chemical or physical changes.

3)Ice is turned into .....when its temperature is between  $0^{\circ}\text{C}$  and  $100^{\circ}\text{C}$ .

- a)solid state                      b)liquid state                      c)gas state                      d)water state

**Q.2) Write the scientific term:**

1) They are changes in matter which are usually reversible and don't affect its structure. (                      )

2) It is the process by which the particles of matter gain energy and changes from solid to liquid state. (                      )

**Q.3) Complete the following by using the words below:**

(Freezing-increase -water-temperature-decrease-particles -melting)

1. When a chocolate cube is exposed to sun rays, its temperature will.....and it will become liquid.



2. Matter can be changed from one state to another by changing its

.....

3. When we put a bottle containing water in freezer its temperature will .....

and becomes solid.

4. Solid state is turned into liquid state by.....process.

5. Liquid state is turned into solid state by.....proCess.

6. By changing the temperature of matter, its.....Speed will change.

7.  $0^{\circ}\text{C}$  is the freezing point of .....

**Q.4) Give reason for :**

-Both melting and freezing processes are considered as physical changes.

.....  
.....  
.....





## Lesson 3 Matter changing states

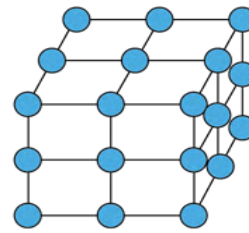


- **Placing a container of ice cubes on hot stove** →

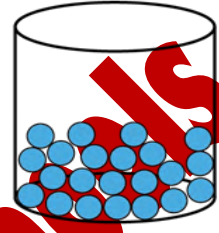
ice gains thermal energy  
changes into liquid

particles move faster and separate

(Melting process)



Solid

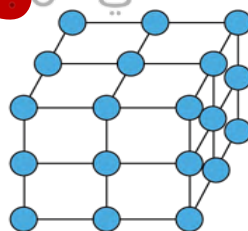


Liquid

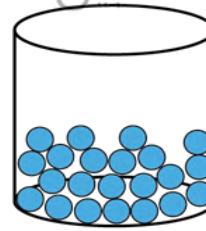
heating

- **Placing water in a freezer** → thermal energy of water  
transferred to the space in the freezer → particles move slower  
and get close together → **it changes into solid (ice)**

(Freezing)



Solid



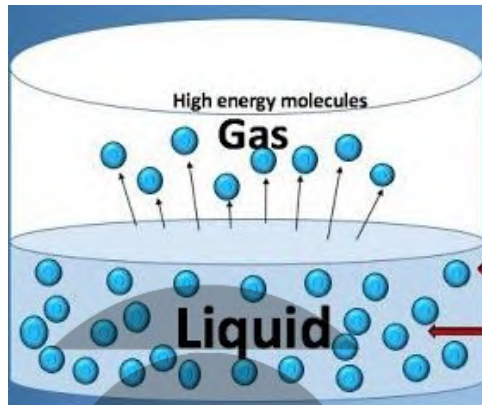
Liquid

Cooling

- When boiling an amount of water → water gains thermal energy →

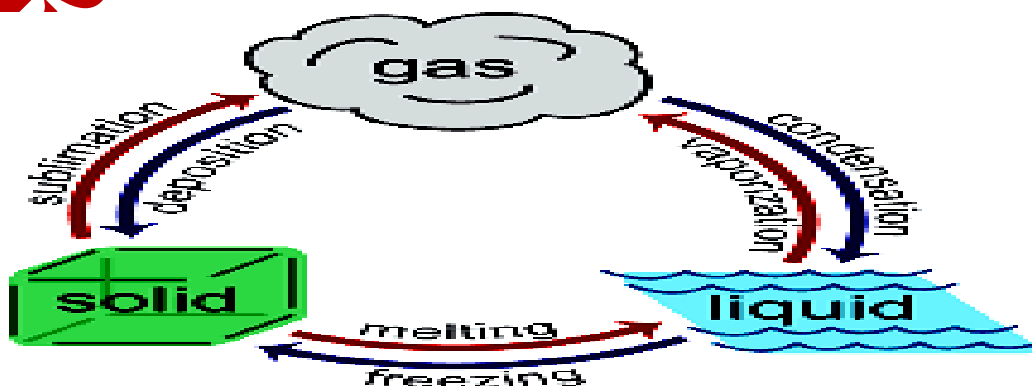
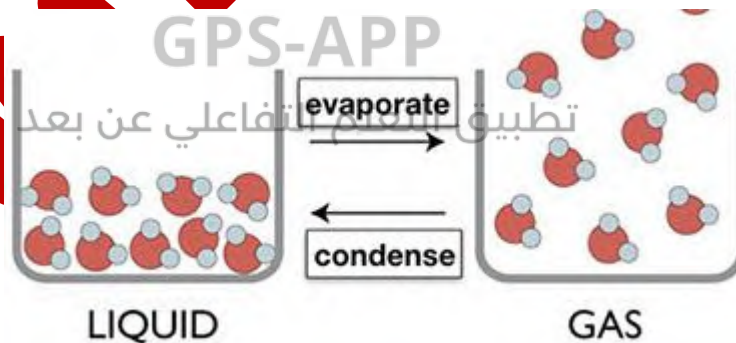
Particles of water move faster and spread more → water changes into water vapor

(Evaporation)



- When water vapor touches a cold lid → thermal energy of the water vapor is transferred to the cold lid → particles move slower and get close together → water vapour changes into water (liquid state)

(Condensation)





## Difference between mixture and compound

| Mixture   | Compound   |
|---|--|
| It is a matter formed of two or more materials .<br>These materials don't combine chemically and mixing them doesn't change them into new substance.<br>Examples:<br>Salty water,atmosphere ,some types of food salads. | It is a matter formed of two or more materials .<br>These materials combine chemically to form a new substance.<br>Examples:<br>Table salt |

- Mixtures can be made of:

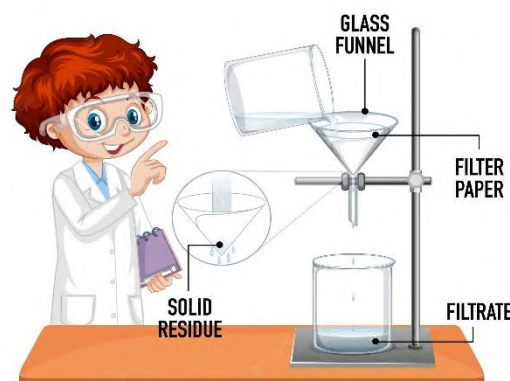
- 1- Sand and rocks .
- 2- Salty water.
- 3- Air.



- Properties of mixture:

- 1- It consists of one or more materials ,these materials don't combine chemically. تطبيق التعلم التفاعلي عن بعد
- 2- The components can be separated after mixing them.
- 3- Each material keeps its properties .

## FILTRATION PROCESS



- Separating of mixtures



1- Filtration (if one material in the mixture has smaller particles than the other material)

**Ex:** separating sand from mixture of sand and water.

- **Properties of mixture:**

4- It consists of one or more materials, these materials don't combine chemically.

5- The components can be separated after mixing them.

6- Each material keeps its properties.

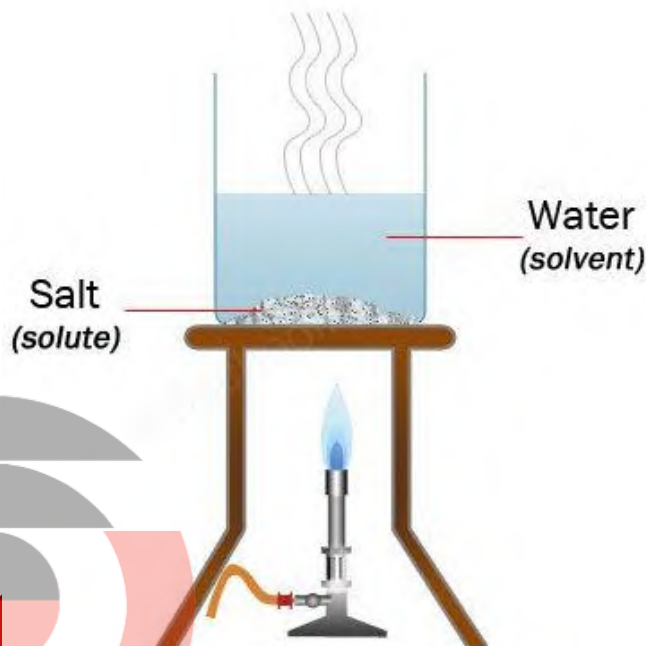
- **separating mixtures**

2- Filtration (if one material in the mixture has smaller particles than the other material)

**Ex:** separating sand from mixture of sand and water.

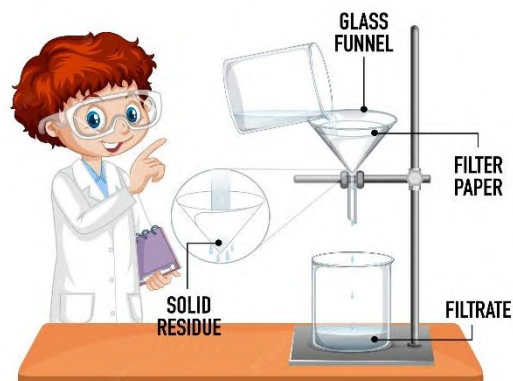
3- Evaporation (to separate materials that evaporate at different temperature)

**Ex:** salt from salty water.



**Worksheet (3)**

## FILTRATION PROCESS



**Q.1) Choose the correct answer:**

1- physical process which need heating include.....

- a- Melting and freezing      b- melting and condensation  
c- melting and evaporation      d- freezing and evaporation

2-when you boil water ,it will.....

- a- Condense      b- evaporated      c- melt      d- freeze

3-To separate sand only from salty water ,we can use .....process.

- a- Filtration      b-evaporation      c-freezing      d- condensation

**Q.2) Choose from column(B) what suits it in column (A)**

| A               |  |
|-----------------|--|
| 1- Condensation | a- Is the change from solid state to liquid state. |
| 2- Melting      | b- Is the change from gas state to solid state     |
| 3- Freezing     | c- Is the change from gas state to liquid state.   |
| 4- Evaporation  | d- Is the change from liquid state to gas state.   |
|                 | e- Is the change from liquid state to solid state. |

1..... 2..... 3..... 4.....

**Q.3) Give reason for:**

1- Fruit salad and salty water are considered as mixtures.

..... تطبيق التعلم التفاعلي عن بعد

**Q.4)Mention the state of matter which form the following mixtures by using the words below:**

(solid and liquid – Gas – solid –liquid)

Fruit salad



Air



Oil in water



Sugar in water



1. .... materials.

2. .... materials.

3. .... materials.

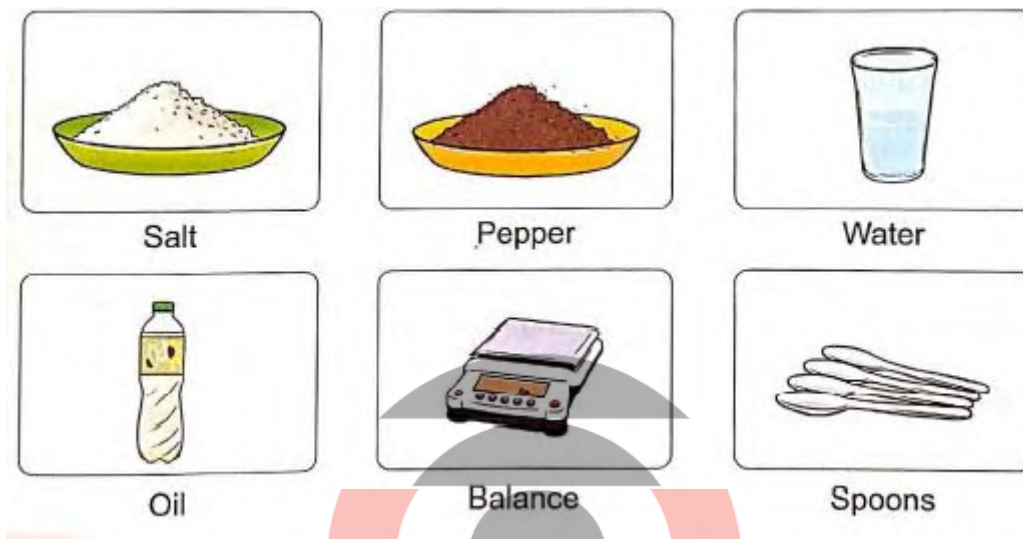
4. .... materials.

## Lesson (4)



### Activity 10: mixing it up with mass

Using the following tools:



1-Weigh 10 gm of salt and 10 gm of pepper with the balance.



2-mix it together, the compare between the sum of their masses before and after mixing.

- ❖ The sum of their masses before and after mixing is equal.
- ❖ The properties of the substance doesn't change after mixing.

3-weigh 10gm of water and 10 gm of oil with the balance.





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4-Mix the water and oil then compare between their masses before and after.

- ❖ The sum of their masses before and after mixing is equal .
- ❖ The properties of the substances doesn't change .

5- Weigh 10gm of salt and 10 gm of water .



6-Mix them and weigh the masses and compare them before and after mixing.

- ❖ The sum of their masses before and after is equal.
- ❖ The properties of the substances doesn't change.

So :the masses of substances before and after are equal of these substances after mixing and their properties don't change(forming mixture)

### Experiment 2

Using the following tools :



1-weigh 10gm of vinegar and 10gm of baking soda

2-mix them together ,then weigh the mixture before and after mixing



- ❖ The sum of their masses before and after mixing is equal.
- ❖ A gas is formed causing bubbles ,so the properties has changed after mixing.

3-weigh 10gm of cornstarch and 10gm of iodine .

4-mix them together ,then weigh there masses before and after mixing.



- ❖ The sum of their masses before and after mixing is equal .
- ❖ A compound formed and it's color is dark blue ,so the properties has changed after mixing.

So: the masses of substances before and after mixing is equal but the properties has changed (when forming compound).



**A) Choose the correct answer:**

1-by adding baking soda to vinegar , a .....is formed .

a-powder      b-compound      c-mixture      d-solid matter

2- The..... of iodine will not change after mixing it with starch.

a-mass      b-color      c-color and mass      d-properties and mass

3-by adding iodine to starch, the color of the formed compound will change into.....

a-dark green      b-dark blue      c- red      d-yellow

4-we mixed 150gm of banana with 50gm of apple , the mass of banana only will be .....gm after mixing.

a-50      b-100      c-150      d-200

**B) Correct the underlined words:**

1-the properties oil will change when mixing it with vinegar. (.....)

2-by adding iodine to starch, their masses will change. (.....)

3-by mixing some vegetables together their properties will change. (.....)

4-the mass of 50 gm of sugar will decrease by adding 100 gm water to it.

**C) Complete the following using the words below:**

( The same -mixture -mass -compounds -color -properties -changed )

1-the mass of mixed substance will not be changed during formation of .....,but their properties will be changed.

2-the mass of salt in salty water will be .....after the mixture is formed.

3-by adding iodine to starch ,their .....will change into dark blue forming a new compound.

4-by mixing salt with pepper, a.....is formed which has no change in the .....and.....of its components.

5-by adding baking soda to vinegar, the properties of the formed substance will be .....



## LESSON (5) PROPERTIES OF MIXTURES

Mixture are made of two or more substances that are physically combined together that means they do not react together.

### EXAMPLE:

The mixture of the salty water consists of water and salt which don't react together.

They can separated by filtration process and evaporation process.

### EXAMPLES:

#### 1- SAND AND WATER.

they separated by using filtration process.



#### 2- OIL AND WATER.

They consists of two liquid materials mixed together.



#### 3- SALT AND PEPPER.

They consists of two solid materials mixed together.



## 4- AIR IS A MIXTURE OF SOME GASES.

### **PHYSICAL CHANGES IN OUR LIVES**

Physical change is a change in the shape of matter without any change in its structure.

Physical changes don't form (new substances) but they can change size, shape or state of matter.

#### **Examples of changes in our lives**

##### **Physical changes :**

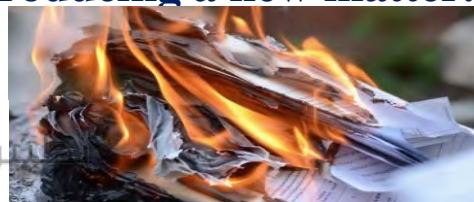
1. Cutting paper
2. Making salad
3. Melting wax



##### **Chemical changes :**

It is a change in the structure of matter producing a new matter.

1. Burning a paper forming ash.



2. Making bread.



3. Iron rust when metals react with oxygen and water.





## 4. Mixing vinegar with baking soda.

### WORKSHEET (5)

#### • Choose the correct answer:

1. Components of ..... mixture can react together.

A) Vinegar and baking soda

B) Salt and

C) water

D) Salt and pepper

2- from the changes which don't form a new substance is

A) Burning of pepper

B) Cutting of wood

C) Baking bread

3- during burning of wood, ..... energies are produced.

A) Electrical and light

B) Thermal and light

C) Thermal and electrical

4- evaporation process is a ..... Change of matter , which can be used to separate..... Components.

A) Physical – mixture

B) Physical – compound

C) Chemical – mixture

#### • Complete the following sentences:

1-Cutting a paper into pieces is considered as a ..... Change, while burning it is considered as a ..... change.

2-Making salad doesn't produce ..... substance.

3-Melting of wax is a ..... Change, while burning of wood is a .....

#### • Correct the underlined words :

1-You can separate oil from water by filtration process. (.....)

2-Melting of wax is chemical change. (.....)

3-Cutting a piece of cloth is considered as a physical change because it produces a new substance. (.....)

4-When you strike a match, light energy and electrical energy are produced. (.....)



#### • Explain the following sentences:

1- The components of mixture don't produce a new substance when combining together.

.....

2-Air is considered as a mixture.



## Lesson (6)

### Changes of matter

➤ **Physical changes:** it is the change in the shape of the matter.

-Change in size:

-Cutting a paper  
Cutting fruit.



-Change in shape:

-Coiling a straight piece of wire to form a spring.



-The flow of sand in an hourglass changes the shape of sand in the container.



-Expected change in

-Adding drops of food





- Coloring a paper



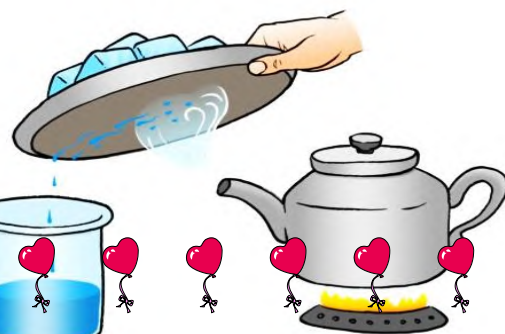
-Melting a butter or ice.

-Evaporation of water.



- Boiling of water

-Condensation of water.



## ➤ Chemical changes:

It is the change in the structure of the matter producing a new matter.

### Examples:

-Unexpected color change

-When mixing iodine with cornstarch, a new substance is formed and its color is dark blue.



-Burning a piece of paper.



-Formation of gas bubbles.

-When mixing baking soda with vinegar, gas bubbles appear.



-Formation of bad odor

-Living a cup of milk out of the fridge for about two days can produce a bad smell (due to the chemical change happens





to milk.



- Making yoghurt from milk.



- Iron rust



- **Iron** rust , when combines with **oxygen** and **water**.

\***Rust** is a chemical substance called **iron oxide** which is a layer with reddish color.

-When **oxygen** combines with **carbon** and **hydrogen**, they release heat that can start **fire**.

\*The fire can change substances as wood into **ash**.

-When **vinegar** combines with **baking soda**, they form **gas bubbles**.





## Worksheet (6)

### 1- Explain:

Formation of dark color which is formed when mixing iodine with cornstarch.

.....

.....

### 2- Correct the underline word:

1-Melting of a piece of chocolate is a chemical change.(.....)

2- When vinegar combines with baking soda, they form rust.  
(.....)

3-The bad odor of the milk is a physical change.(.....)

### 3-Complete the following sentences:

1-Making yoghurt from milk is a .....change.

2-The change in the structure of the original matter producing a new matter is known as ..... change.

3-Cutting a fruit is a ..... change.

4-Mixing baking soda with vinegar is a ..... change.

### 4- Give reason for:

1- Formation of a layer with reddish color on the surface of wet iron.

.....

2- Formation of a bad odor when milk is left out of the fridge for several days.

.....

## Lesson (7)

### Water

-Fresh water is about 70% of the surface of the earth which is covered by oceans.

-The water of the seas and oceans is a mixture of minerals, gases, living organisms and dead o

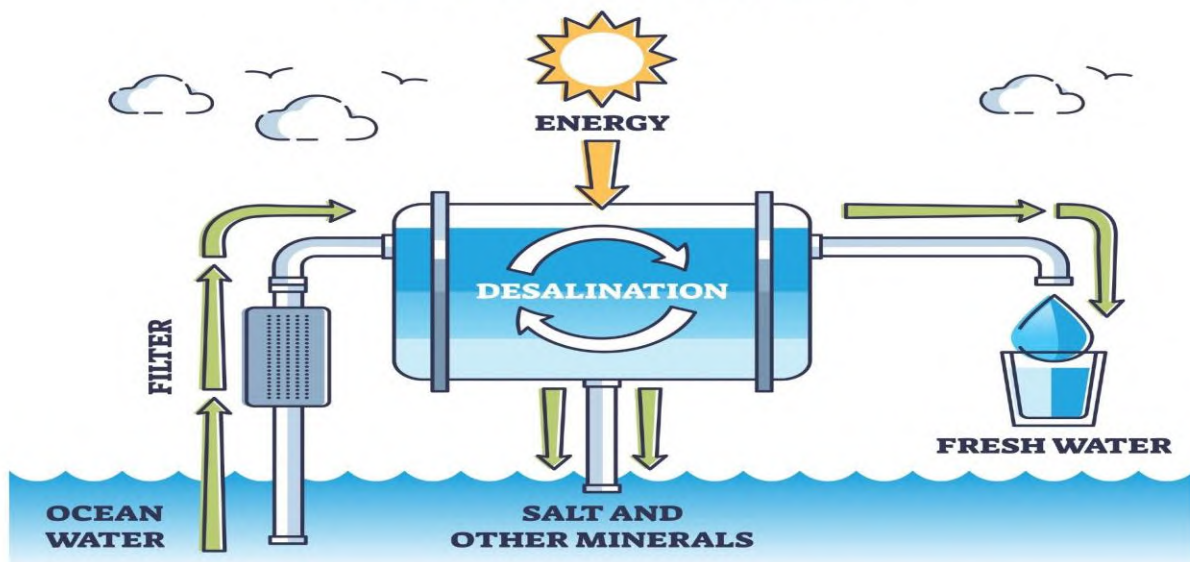
#### Mixture:

is a matter formed of two or more materials that don't combine chemically.



#### **Desalination:**

It is the process of removing salt from water.





➤ **The components of mixtures can be separated by the following processes:**

### 1-Filtration:

It removes any large materials such as seaweed, shells and fish.

► Water, salts, minerals and gases would pass through filters that makes water still undrinkable.

### 2- Evaporation:

When boiling the filtered water, water vapor rises up leaving salts and other minerals.

► When cooling the water vapor, it is turned into liquid water and it is safe to drink it.

★ Filtration and evaporation are used to

Separate fresh drinkable water from water of seas and oceans

### ➤ **Problems of desalination (disadvantages).**

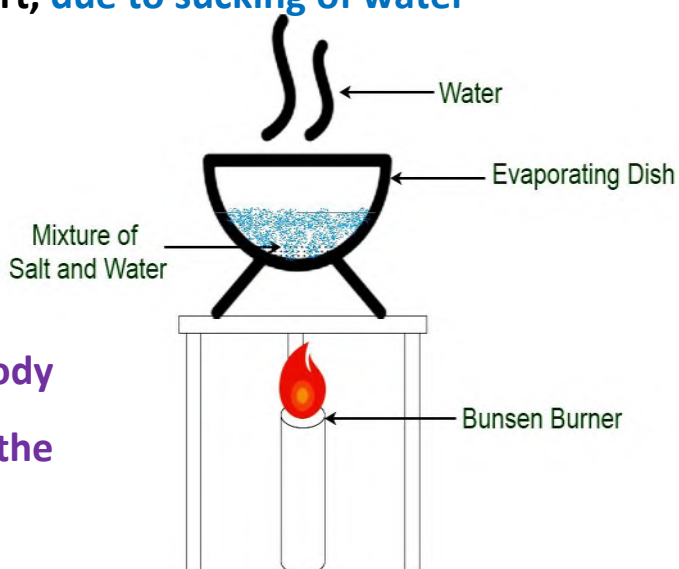
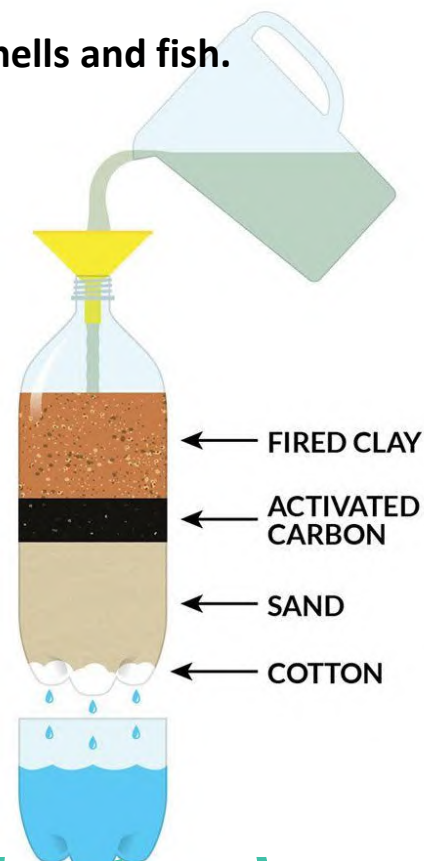
► It needs a big amount of energy.      ► It is very expensive process.

► Small marine organisms can be hurt, **due to sucking of water into the desalination plants.**

► It may cause many environmental problems.

### Note:

drinking salt water makes human body dehydrate faster which means that the human body loses water faster.



### 1-Choose the correct answer:

**d. salt, minerals and living organisms.**

**d. hydrogen gas**

**d-seaweed**

.....

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.....

## Model answers

### Unit (1)

#### Concept (1.1)

#### Worksheet (1)

##### 1-Choose

1-d

2-a

3-b

4-a

5-b

##### 2-write the scientific term

1-Carbon dioxide.

2-water.

3-photo synthesis.

4-oxygen.

##### 3-Cross out the odd word

1- Oxygen gas.

2-sunlight.

##### 4- Choose from column (B) what suits it in column (A)

1-b

2-c

3-a

4-a

#### Worksheet (2)

##### 1-a

##### A-Germination

##### B-soil

2-1 Figure (A).

Figure (B)

2-Soil.

#### Worksheet (3)

##### Q1: Write the odd word

1. Eyes    2. Vegetables    3. Oxygen

##### Q2: put true or false

1. ✓

2. X

3. X

4. ✓

5. X

6. X

7. ✓

8. ✓





**Q3: write the scientific term**

1. Photosynthesis process
2. Sunlight
3. Leaves
4. Stomata
5. Stomata
6. Xylem

**Q4: Write the definition of**

1. **Photosynthesis process:** It is the process through which plants use the energy in sunlight to make their own food
2. **Stomata:** They are tiny openings that allow air to move into the leaves
3. **Xylem :** it's a vessels that Transfer water and nutrient from roots to other plant's part

**Q5: 1. Complete the following**

1. Leaves
2. Flower
3. Stem
4. fruit
5. Roots

**Worksheet (4)**

**Q1 Complete**

1. Oxygen
2. Sunlight,  $CO_2$ , water and mineral salt
3. Xylem
4. Light or solar
5. It absorbs water and mineral salts from the soil
6. Upright stem
7. Tubers
8. Narrow leaves

**Q2 Put (true) or (false)**

- |      |      |      |
|------|------|------|
| 1. ✓ | 2. x | 3. ✓ |
| 4. x | 5. ✓ | 6. ✓ |
| 7. ✓ |      |      |



1-Complete the following sentences:

1. Glucose
2. The leaves - the nose-the mouth
3. The heart - blood vessels.
4. Glucose - the body cells.
5. Circulatory
6. Leaves
7. Xylem - phloem.
8. heart- xylem - roots
9. light-chemical
10. Seeds - reproduce.
11. Arteries - veins.

2- Give reasons for

1. Because flowers produce seeds for the plant that help the plant to reproduce.
2. Because it transports blood and other fluids through the body.
3. Because xylem carry water and nutrients from the roots to the leaves.

Worksheet (6)

| <i>Ways of seeds dispersal</i> | <i>Seeds</i>   |
|--------------------------------|--|
| <i>Floating on water</i>       | <i>Coconut seed</i>  |
| <i>Traveling by wind</i>       | <i>Maple seeds- dandelion seeds<br/>(both of them are light seeds)</i> |
| <i>Sticking to animal fur</i>  | <i>Burdock seeds (have spines)</i>                                     |
| <i>Being eaten by animals</i>  | <i>Tomato seeds- apple seeds</i>                                       |



## **Concept (1.2)**

### **Worksheet (1)**

#### **Q1 Write the scientific term of each of the following**

1. Ecosystem.
2. Photosynthesis.
3. Light energy.
4. The Sun.
5. Plant
6. Glucose.
7. Carbon dioxide gas.
8. Oxygen gas.
9. Plants.

#### **Q2 Give reasons for:**

1. To get his needed energy and to do his activities

### **Worksheet (2)**

#### **Q.1 Complete**

1. Producers
2. Glucose - photosynthesis
3. Consumers
4. Plants
5. Decomposers
6. Primary
7. Recycling

#### **Q2 what happens if**

1. The secondary consumers will move away to another ecosystem to search for food or they will die.
2. Dead organisms will not be decomposed, and their nutrients will not return back to the soil.





## Worksheet (3)

### Choose

1. d
2. b
3. c
4. b
5. c
6. b
7. c

### Lesson (4)

Q1. Complete the following sentences using the words below:

1. Food                      2. food web                      3. primary consumers

Q2. study the opposite food web, then choose the correct answer

1. b                      2. d                      3. c                      4. d                      5. b

Q3. study the following (the sun) <sup>10</sup>

### Lesson (5)

Q1. Put (√) or (x)

- |        |        |        |        |
|--------|--------|--------|--------|
| 1. (√) | 2. (√) | 3. (x) | 4. (x) |
| 5. (√) | 6. (x) | 7. (√) | 8. (√) |
| 9. (X) |        |        |        |

Q2. Write the scientific term of each of the following:

1. Decomposition process.
2. Scavengers.
3. Decomposers.
4. Recycling process.

Q3. complete:

1. Food web.
2. Scavengers decomposers
3. Producers.



4. *Decomposers - scavengers.*
5. *Water.*
6. *Fungi.*
7. *Recycle.*

Lesson (6)

Q1 Choose

1. *b*                      2. *d*                      3. *d*                      4. *d*                      5. *a*

Q2 put (✓) or (x)

1. (✓)                      2. (x)                      3. (✓)                      4. (x)                      5. (x)

Q3. Write the scientific term of each of the following.

1. *Ecologist.*
2. *Plants.*
3. *Prairie.*

Concept 1.3)

Lesson (1)

➤ Choose the correct answer.

- 2) B
- 3) A
- 4) C
- 5) B
- 6) D

➤ Put (✓) or (x) :

- 2) (x)
- 3) (X)
- 4) (✓)

➤ What happens if..?

- 2) They will pollute water and the marine organisms will be negatively affected.
- 3) The water of lake decreases due to its evaporation.

Lesson (2)



➤ Write the scientific term for each of the following:

- 2) Tertiary\_consumer
- 3) Decomposers

➤ Complete the following sentences:

- 1) Prey
- 2) Energy

➤ Put (✓) or (x) and correct the answer:

- 1) (X) 10% of the energy in a food web transfers between living organisms when an organism feeds on the other.
- 2) (✓)
- 3) (X) The plant produces energy that decomposers use to make their food.

➤ Choose the correct answer :

- 1) D
- 2)b
- 3)d

➤ Give reasons for:

- 2) Because by increasing the water temperature microorganisms will move to another cold water so the small fish will move also and the sea birds will die.
- 3) Because pollution negatively affects all living organisms in food webs.

➤ Write the scientific term of each of the following:

- 2) Microorganisms
- 3) Population
- 4) Pollution

➤ Study the following two diagrams, then put (✓) or (x) :

- 2) (X)
- 3) (✓)
- 4) (✓)
- 5) (X)





Lesson (4)

• Choose the correct answer:

1- C    2-B    3-B    4-B

• Write the scientific term of each of the following:

- 1- Coral bleaching
- 2- Micro plastic
- 3- Recycling

• Complete the following sentences using these words:

- 1- Shelter
- 2- Overfishing
- 3- Extinction
- 4- Predator

• Give reasons for:

- 1- Because when the water temperature rises the coral reefs get rid of algae from their tissues.
- 2- Because rising of water Cause coral bleaching, and micro plastics are toxic and sharp.

Lesson (5)

• Put (✓) or (X) in the following:

- 1- ( ✓ )
- 2- ( ✓ )
- 3- ( X )

Choose the correct answer:

2- C                      2-A                      3-D



• Put (✓) or (x) :

1- (✓)

2- (X)

3- (✓)

• Write the scientific term of each of the following:

1- Nursery

2- Habitat Restoration

• Choose the correct answer:

1- B

2- A

3- B

4- D

• Give reasons for :

Because restoration Projects take a lot of money and a long time.

**MODEL ANSWERS**

**CONCEPT 2.1**

## Worksheet (1)



1-Write the scientific term of each of the following

1- Hardness

2- Gas

2- Choose the correct answer:

1-c

2-a

3-d

4-c

3-What happen if.....?

-It becomes a solid.

Worksheet 2

1-Give reasons for:

1. Because it is a gas

2. Because it is a solid

3. Because it has definite shape and volume.

2-Put ✓ ☐ or ☐ and correct



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1. ✓ ☐

2. ☐ , Gases

3. ☐ , don't have

4. ✓ ☐

5. ☐ , energy

3- Choose from column (A) what suits it in column (B)

1-a

2-d

3-b

1-Cross out the odd word:

1- Gasoline

2- Vinegar

3- Air

2- Complete the following sentences:

1- Particles

2- Liquids

3- Liquids

4- See – Feel- Smell

5- Gases

3-What happens if.....? It will increase.

## Worksheet 4

Choose the correct answer :

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1. (b) volume
2. (b) faster-water vapor
3. (a) solar system
4. (d) microscope

### Give reason for :

- 1- To see the components of particles .
- 2- Because it can make ideas more clear .

### What happen to.....?

- The size of the ballon will increase

### Choose the correct answer :

1. (b) water
2. (a) solar
3. (c) volcano
4. (a) solid
5. (c) fill any container they are put in.

### Write the scientific term of each of the following :

- 1- Globe
- 2- Model

### Complete the following sentences:

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- 1- Shape or volume
- 2- globe
- 3- Volume - shape

Give reason for :

Because their particles are arranged randomly

What happen to.....?

- it will be organized

**MODEL ANSWER**

**CONCEPT**

Worksheet 1

- A) 1-false    2-true    3-false    4-true
- B) 1-b    2-c    d-b    d-a
- C) 1-ceramic    2-length    3-mass    4-length
- D) 1-c    2-a    3-b    4-d

**Worksheet 2**

- A) 1-b    2-c    3-b    4-b
- B) 1-false    2- false    3- false    4-true
- C) 1-mass    2-volume    3-burning    4-physical
- D) 1-physical    2-odor    3-rough



## Worksheet 3

A)1-a      2-b      3-a      4-d

B)1-true      2-true      3-false      4-true

C)1-doesn't attract – floats      2-sinks –attracted      3- iron – cotton  
4-mass

D)1- The magnet will attract the iron nail but not the plastic cup.

2-It will float on the water surface

1 (A)1.d

2.b

3.a

(B) Because glass is transparent

2 (A) 1. Rusting (all items are physical properties of matter while rusting is a chemical property of matter).

3. Kilogram (all items are measuring units of volume, while kilogram is a measuring unit of mass).

4. Iron nail (all items are not attracted to the magnet, while iron nail is attracted to the magnet).

(B) The piece of cork will float on the surface of water.

3 1. B – hard – strong.

2. C - waterproof - flexible.





## Worksheet 5

1 1.c

2.a

3.b

(B) To guide ships through dangerous water.

2 (A) 1.( )

2.( )

3.( )

(B) you feel hot because copper is a good conductor of heat.

3 1. Mass – kilogram.

2. Bakers

3. length – meter.

4. architects

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## MODEL ANSWERS

### CONCEPT 2.3

#### Worksheet 1

Q.1) Choose:

d-heating                      c-ice.                      b-move faster

Q.2) ( ) or ( x ):

1- x                      2-x

Q.3) Write scientific term:

1- Gas state .                      2 – Melting process.

Q.4 ) Complete

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1-solid – shape –volume.

2- close together.

**Q.5) Give reason:**

1- Because the temperature increases so it will melt and becomes liquid .

2-Becsuse air is considered as a gas state of matter.

**Q.6)What happens if:**

1- It doesn't change

2- The particles of water will move faster.

**Q.7)Look at the following pictures**

1- Picture 1, because it has definite shape and volume.

2- Picture 3, it has definite volume but doesn't have definite shape.

3- picture 2, it doesn't have definite shape and volume.

4- 1\_3

## Worksheet 2

**Q.1) Choose:**

1- b) low

2- a) physical changes only

3- b) liquid state

**Q.2)Write the scientific term:**

1- Physical changes.

2- Melting process

**Q.3) Complete:**

1- increase.

2- temperature

3- decrease

4- melting

5- Freezing 6- particles 7- water

**Q.4) Give reason:**



Because in these processes the matter changes without any change in its structure.

### Worksheet 3

Q.1) Choose

1 -c                      2-b                      3-b

Q.2)

1- c                      2-a                      3-e                      4-d

Q.3)

Because they are formed of two or more materials

Q.4)

1-Solid

2- gas

3-liquid

4-solid and liquid

### Worksheet 4

A)1-b    2-a    3-b    4-c

B)1-baking soda                      2-properties

3-will not                      4-remain constant(still the same)

C)1-compounds                      2-the same                      3-color                      4-mixture -mass-  
properties    5-changed





## Worksheet 5

1. Choose the correct answer:

- 1- A
- 2- B
- 3- B
- 4- A

2. Complete the following sentences:

- 1) Physical – chemical
- 2) New
- 3) Physical – chemical

3. Correct the underlined words :

- 1- Sand
- 2- Physical change
- 3- Doesn't produce
- 4- Heat

4. Explain the following sentences:

- 1- Because the components of mixture are physically combined together that means they don't react together .

Because it consists of a mixture of some gases.



## Worksheet 6



### 1- Explain:

Because of the chemical change that happens to the cornstarch after mixing it with iodine.

### 2- Correct the underline word:

- 1- physical
- 2-gas bubbles
- 3-chemical

### 3-Complete the following sentences:

- 1- chemical
- 2- chemical
- 3- physical
- 4-Chemical

## Worksheet 7

### 1-Choose the correct answer:

- 1-d
- 2-b
- 3-a

### 2-Give a reason for the following:

Because it's a mixture of water, salt , other minerals, gases, living organisms and dead organisms.



### 3-what is the definition of...?

Desalination:

It is the process of removing salt from water.



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